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Cultivating Place, Livelihood, and the Future: An Ethnography of Dwelling and Climate in Western Greenland

by

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Abstract

In order to investigate how Inuit Greenlanders in western Greenland are experiencing, responding to, and thinking about recent allegedly human-induced climate change, this dissertation ethnographically examines the lives of Greenlanders as well as Norse and Danes in the course of past historical natural climate cycles.

My emphasis is on human endeavours to cultivate a future in the face of difficulties caused by climatic and environmental transformation. I recognize locals' initiatives to carve out a future in the promotion of sheep farming and tree-planting in southern Greenland and in adaptation processes of northern Greenlandic hunters to the ever-shifting environment.

Sheep farming was introduced by those Danes who were inspired by the existence of Norse society in the Middle Ages on the island, and tree-planting was initiated, presumably for experiment purposes by Danes and other outsiders. Some self-reliant, independent Greenlanders who could envision an alternative life in farming took over and developed a sheep farming tradition. Whether tree-planting can take hold in a Greenlandic sociocultural landscape is still open to question. With government support, Greenlandic farmers managed to adapt their livelihood to the harsh climate although this created their dependency on the government and global economy. In the trial-and-

error adaptation process, farmers learned historical fluctuations of temperature. This relates to what the Norse ruins scattering throughout southern Greenland tell farmers – a sense of continuity of people's lives from the past to the present. This becomes their frame of reference in holding a view of the future.

Like sheep farmers, hunters in northern Greenland are fully competent in a transient landscape and are flexible enough to cope with novel shocks in the environment. However, unlike farmers', their effort to envision a future has often been frustrated by larger forces, including international politics. Locals' narratives on climate change well reflect their expectations, frustrations, and anxieties.

It is important to create a situation where people can freely envision a better way of life, explore future possibilities, and realize the values they have for life. This will lead to the continuance of individuals' lives, local communities, and − ultimately – to the building of a sustainable nation.

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Qujanakulukulukulooq savaatillinnut, aamma aalisartunut piniartunullu oqaloqatigiikkatta silaannaap allangoriartornera pillugit! Aamma, Sioarapalummi Qaanaamilu piniartunut qujanarujussuaq!

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List of abbreviation

ACIA	Arctic Climate Impact Assessment
AFS	American Field Service
AMAP	Arctic Monitoring Assessment Programme
AR4	Fourth Assessment Report (of the IPCC)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
Dan.	Danish term
DANIDA	Danish International Development Agency
DMI	Danmarks Meteorologiske Institut (Eng. Danish Meteorological Institute)
Eng.	English term
GEUS	De Nationale Geologiske Undersøgelser for Danmark og Grønland (Eng. Geological Survey of Denmark and Greenland)
Gl.	Greenlandic term
GTO	Grønlandsk Teknisk Organisation (Eng. Greenland Technical Organization)
IASC	International Arctic Science Committee
ICC	Inuit Circumpolar Council
IPCC	Intergovernmental Panel on Climate Change
Is.	Icelandic
KNI	Kalaallit Niuerfiat (Dan. Grønlands Handel; Eng. Greenland Trade)
KNAPK	Kalaallit Nunaanni Aalisartut Piniartullu Kattuffiat (Dan. Den Grønlandske Fisker- og Fanger-Organisation; Eng. Greenland Fishers and Hunters' Association)
KNR	Kalaallit Nunaata Radioa (Greenlandic Broadcasting Corporation)
NAMMCO	North Atlantic Marine Mammal Commission
PAR	the Pressure and Release model
POPs	Persistent Organic Pollutants

SAP	Savaateqarnerup Annertusarneqarnerani Pilersaarut (Dan. Udviklingsprojekt for Fåreavl; Eng. Development Project for Sheep Farming)
SNS	Samarbejdsnævnet for Nordisk Skovforskning (Eng. Nordic Forest Research Co-operation Committee)
SPS	Savaatillit Peqatigiit Suleqatigiissut (the Federation of Sheep Farmers' Associations)
TAR	Third Assessment Report (of the IPCC)

1. Introduction

This PhD dissertation ethnographically describes the lives of Inuit-descended residents in western Greenland (Gl. sg. *kalaaleq,* pl. *kalaallit*; hereafter Greenlanders) as being in the midst of a changing climate.[1] By a changing climate, I mean historical, natural climate cycles and the recent, allegedly "human-induced," global climate change.[2] The so-called human-induced global climate change has recently been manifested in various parts of the world and this is also the case in Greenland. There has been concern over how local residents can cope with regional and local environmental changes caused by global climate change (Anisimov et al. 2007). This dissertation deals with the social implications of climate change in western Greenland; how Greenlanders are experiencing, responding to, and thinking about such climatic and environmental changes; and how Greenlanders try to cultivate a future in the course of environmental, social, and political transformation.

This ethnographic study concerns Greenlanders' human–environment relationship. I do not deal with this theme just as a matter of the environment, but rather explore it within a broader social, political, and historical context. By means of investigation, I examine how Greenlanders are vulnerable to, cope with, and adapt to a changing climate, but my emphasis is on the social, political, and historical circumstances upon which climate change bears, including

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[1] Greenland can be divided into three parts in terms of socio-cultural differences as oppose to the administrative division: northern Greenland (*Avannaa*), western and southern Greenland, and eastern Greenland (*Tunu*). This dissertation does not cover eastern Greenland.

[2]Following Article 1 of the United Nations Framework Convention on Climate Change (UNFCCC), I use the term "climate variability" as natural change in the climate system while "climate change" is meant as human-induced change (UNFCCC n.d.).

nationalism, community, migration, and Greenland's international relations.

It is not only Greenlanders who dwelled in Greenland. Norse and Danes lived in Greenland and Danes are still present on the island. They made their home in Greenland, and had a view of the future in Greenland from outside and inside. Accordingly, I include these people in my discussion. Their presence in Greenland had significant bearing on Greenlanders' relationship to the environment and their livelihood.

One of the themes running through this dissertation is also with how people have grasped the present state of their lives in relation to the past and envision their future. In other words, I am interested in how people's understanding of the past, and their active engagement with historical landscapes, informs their understanding of the present and also inspires their thoughts about potential future livelihoods. To adequately address this, I consider the history of the development of sheep farming and other forms of agriculture, tree-planting, and hunting as well. Landscapes of Norse ruins scattering throughout southern Greenland are also an important topic to discuss.

In my discussion, I use the concept of tradition borrowing Tsurumi's (1989, 1996) theory. Using this concept, I would like to discuss locals' endeavours to create an alternative way of life, and locals' efforts to achieve a better future in order to realize their values for life.

Revolving around climate change, this dissertation discusses how Greenland locals have carved out lives, have nurtured and shaped their relationship to the environment, and have cultivated a future from a viewpoint of their understandings of local climate and environmental change.

This dissertation draws on extensive fieldwork in western

Greenland and intensive archival and historical research. My ethnographic foci are, from southwestern Greenland, a group of sheep farmers and plantations, with secondary emphasis on the hunters/fishers from the same area and from northern Greenland. These case studies facilitate analyses of the developmental processes of traditions, perceptions of the landscapes and change in the environment, and narratives of current climatic change.

Climate change and society

I would like to state the circumstances of the time when I was planning my research project on climate change and society. At least when I planned out my research project (around 2007), the word "climate change" was already a cliché, such that climate anomalies and unusual weather conditions experienced in various parts of the globe were seen in association with human-caused global climate change. The contexts in which these climate change stories were told varied, ranging from scenes of everyday life and media reporting to high level political debates. How could we interpret these discourses of climate change? How could we act on information about climate change? This is the very starting point for my research on climate and society in Greenland.

From climate science to social sciences

While some regard climate change as a warning to humans in the modern age, some still cast doubt on the reality of climate change as such, or are sceptical of the discourse that global climate change is induced by human activity. For example, there may be some corporations and politicians whose interests might be adversely

affected if anthropogenic climate change is affirmed.

By the beginning of the 2000s, however, a consensus that global climate change was induced by greenhouse gas emissions from human activity had already been reached in the scientific community, including the Intergovernmental Panel on Climate Change (IPCC), the National Academy of Science, and the American Association for the Advancement of Science (AAAS). Oreskes (2004) analyzed 928 abstracts appearing in peer-reviewed scientific journals dealing with global climate change between 1993 and 2003, and found that the majority of the articles accept, explicitly or implicitly, the view that global climate change is anthropogenic and none of the articles disagree with the consensus position. It is also recognized that anthropogenic alterations in the climate system (warming in most cases) are happening more rapidly and more extensively than in any other periods of human history.

These sayings are quite shocking and appeal very much to the better nature of those who are conscious about environmental issues, particularly in developed countries. Climate change, together with other environmental concerns such as deforestation, biodiversity loss, and pollution, will urge people to rethink ways of living in times of modernity. To attend to these matters require high-level political initiatives because the means of coping with the adverse impacts of climate change and its mitigation relate to wide-ranging issues, such as energy policy, resource consumption, carbon capture and storage, industrial structure, and urban planning. In order to convince policymakers, it is necessary to show credible projections based on hard science such as the earth and atmospheric sciences. Momentum was gathering to motivate politicians and policy makers to take appropriate and immediate action to combat ongoing climate change, based on the existing volume of research on climate change. Notable

in this regard are the extensive reports compiled by the IPCC (Parry et al. 2007).

The IPCC was created in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), both being United Nations organizations. It synthesizes and evaluates the current understanding of climatic and environmental change by reviewing peer-reviewed and published scientific literature, with a view to informing policy action. The synthesis report of the IPCC Fourth Assessment Report (compiled for policymakers) clearly reflects the IPCC's political purposes. Stating that "warming of the climate system is unequivocal" (2007:5), the authors made a concerted effort to translate outcomes of scientific assessment into tangible phrases, using likelihood ranges, such as "very certain" (the assessed probability of the occurrence of projected climatic change is more than 99 per cent), "very likely" (90 per cent), "likely" (more than 66 per cent), "unlikely" (33 per cent), and so forth. It seems that these wordings are expected to have some power to influence politicians and policymakers.

The Fourth Assessment Report (AR4) of the IPCC explains the causal sequence of climate change impacts on the area from the Canadian eastern Arctic to Greenland as follows. Substantial warming is projected for the Arctic region over the 21st century, more than the global mean (Christensen et al. 2007:851). According to climate change models focusing on the regional scale, the temperature increase in the Arctic will reach 5ºC by the end of this century (Christensen et al. 2007:904). The most striking physical features of the Arctic are snow and ice, which cover a vast spread of the oceans and lands of the circumpolar North. The reduction of ice extent will lead to an increase in temperature at the surface because as the reflection of solar radiation decreases, the absorption of solar radiation

increases. Changes in the physical environment, such as changing extent of the Arctic sea ice, will bring about significant impact on biota in the region. For example, if caribou – species that play an important role in the food chain of an Arctic ecosystem – are affected by a changing environment, the change in the caribou population is expected to have impacts on lichen, plants, and animals in the whole region to some extent. Finally, environmental change caused by physical environmental change eventually has an impact on the lives of people who reside in the affected environment. This final stage of the chain reaction matters for our everyday life. Needless to say, changes in the physical system, such as a decline in sea ice, will directly affect hunting activity and travel safety of local indigenous people. These are matters of food accessibility and availability as well as issues of cultural survival (cf. Nuttall et al. 2005).

The Third Assessment Report (TAR) of the IPCC, published in 2001, emphasized vulnerability of human society to projected trends in climatic and ecological systems. At this point, the human dimension of climate change (from the physical system to ecosystems to society) drew attention from scientists. International research projects launched in the 2000s followed the IPCC's concepts of "vulnerability" and "adaptation" and this sequence of climate change impact moving from the physical system to people's lives. The Millennium Ecosystem Assessment, a project triggered by a speech given by then Secretary-General of the United Nations Kofi Annan in 2000, concluded in 2005 that the change in the ecosystem will very likely impact the livelihoods of indigenous people (Chapin et al. 2005). Also, in a similar fashion, the Arctic Climate Impact Assessment (ACIA), carried out under the auspices of the Arctic Council and the International Arctic Science Committee (IASC), describes implications of climatic change, where change in the physical environment will lead to ecosystem changes and

finally to human societal changes (Huntington et al. 2005; Nuttall et al. 2005).

By the time I started to visit Greenland in 2007, the question of whether climate was really warming owing to human activity was not an issue any more; the focus had moved from merely reporting climate change as fact to settling on the discussion of human adaptation to ongoing climatic change. In the 2000s, anthropologists increasingly published case studies from across the globe, where indigenous peoples bore witness to unprecedented alterations in the climate system and the environment in which their subsistence and livelihoods take place (e.g., Ford et al. 2006, 2008, 2010). As far as the Arctic environment is concerned, changes in the physical environment, such as sea ice reduction and thawing permafrost, and changes in the ecosystem, including alterations in wildlife habitats, were already reported from Inuit communities in the Canadian western Arctic (Krupnik and Jolly 2002; George et al. 2004; Nichols et al. 2004) and Nunavut (Huntington et al. 2004). At the same time, it is observed that they coped with novel climatic events and environmental change by utilizing both traditional social practise and innovative institutions (e.g., Berkes and Jolly 2002). Now that signs of climate anomalies and unusual environmental change are evident, the next step for climate change research is to investigate whether people living in the Arctic will be able to adapt to probable changes in future.

The need for climate change research in the Greenlandic context

Greenland has intrigued many climate scientists for a long time. Gases trapped in ice columns obtained by drilling ice cores from the Greenland Ice Sheet reveal past fluctuations of air temperature from tens of thousands of years ago (Dansgaard 1954; Vinther et al. 2010).

The monitoring of the extent of Arctic sea ice has proved that it has a downward tendency (e.g., "Sea Ice Outlook" [Arctic Research Consortium of the United States (ARCUS) n.d.]). It is projected that the melting Greenland Ice Sheet will likely contribute to rises in global sea levels in the coming decades, which has become one of the biggest issues of the climate change debate (Rahmstorf 2010). In this manner, there has been an abundance of (natural) scientific findings that will facilitate predictions of future trends in the climate system and ecosystems. Compared to the natural science fields, if any, the human dimension of climate change in the Arctic has obtained scant attention (Ford et al. 2006, 2008, 2010; Ford and Smit 2004). Particularly, the number of research projects carried out on this matter in Greenland is very few (Nuttall 2009, 2010; Goldhar and Ford 2010). It is not only the case for Greenland. As for the Circumpolar North in general, the pressing issue is a lack of research on the social implications of climate change (Nuttall 2001; Hastrup 2009).

The adaptive capabilities of the Arctic's local inhabitants are continuously challenged by both external and internal factors (Anisimov et al. 2007:655). It is of immediate importance to examine how Arctic inhabitants, from the individual to the regional levels, might be adapting to environmental changes and how their coping strategies have informed their adaptive processes, vulnerability, and sustainability. Individuals and communities in different areas have different responses to climate change, reflecting economic and sociocultural differences (Chapin et al. 2005). In order to evaluate local adaptive capabilities to environmental change in the Arctic, an accumulation of place-based research is needed (Eriksen et al. 2005).

For this dissertation, I chose sheep farming and other forms of farming and tree-planting from southern Greenland in addition to fishing and hunting. Traditionally, scholars of Greenland have

focused their research on fishing and hunting in the northern and western regions (Nuttall 1992; Caulfield 1997; Dahl 2000; Sejersen 2004). Using these research targets, I intend to show the characteristics of localities that create peculiar social consequences of climate change.

Can we expect that only environmental factors cause impacts of climate change?

Southern Greenland is an interesting place to study. While in many places in the Circumpolar North, for example, Nunavut and northern Greenland, climate change is thought to bring only negative effects to the locals, in southern Greenland there is a vague sense of expectation that an opportunity arises as the climate becomes warmer.

For example, it was just seven months before I actually started my fieldwork in Greenland that *The New York Times* featured an article about four pine trees, which have survived over one hundred years, at the bank of a fjord in southern Greenland (see Chapter 8 on plantations). Carrying the headline "Climate Change Greens Up Greenland," the newspaper report of October 28, 2007 says that a warming climate rejuvenated the pine trees that were thought to be dead a long time ago (Lyall 2007a). The article maintains that a warming climate is favourable for growing vegetables. In addition, the online version of the paper tells an additional story. An old sheep farmer near Qassiarsuk told the reporter that as a warming climate was making the lambing season earlier and sheep grazing period longer, young farmers would be able to have many possibilities in the future (Lyall 2007b).[3] These news articles were written in a rather

[3] During my fieldwork, I got acquainted with this old farmer. It turned out that he was a retired sheep farmer and did not directly involve in sheep farming any more.

welcoming, positive, and optimistic tone, giving a different impression than other articles on climate change. In effect, the Arctic, as it undergoes climate change, was always described by the media as evoking pessimistic, negative, or disquieting undertones.

There is no doubt that the media have been playing a greater role in providing information about climate change and in creating a general popular image of it. Journalists travel all over the world looking for stories that will provide newsworthy coverage, continuously providing information and photographs from places supposedly on the front line of climate change. Indeed, I often had an opportunity to meet journalists and TV crews from the U.S., Japan, Korea, and elsewhere during my work in Greenland (e.g., Folger 2010). Climate change in Greenland provides good stories to them. One of the schematic views that journalists particularly prefer to use in portraying climate change in Greenland, which I learned through their meetings, is that warming causes the Greenland interior ice sheet to melt at a faster pace than ever before and the loss of sea ice is making it difficult for hunters to continue hunting, while sheep farmers in southern Greenland are likely to benefit from it owing to an extended growing season and warmer temperatures.

The way this kind of newspaper article tells a story is false. If the social impact of climate change is determined only by the environmental factor, differences in climate change impact come only from differences of geographical settings. For example, some localities are potentially subject to natural disasters including storms and floods. This is the case for Bangladesh and Tuvalu. These low-lying countries may have more problems with climate change compared to mountainous countries.[4] However, impacts of climate

[4] The Greenland Ice Sheet covering approximately 80 percent of its landmass has been melting at a faster pace than expected (Rahmstorf 2010). This is projected to

change are not determined only by environmental characteristics of place but also by societal circumstances surrounding the place.

The interactions between society and the environment are more complex than we think, rather than "Cause A" invariably leading to "Phenomenon B" (Fisher and Feinman 2005). For example, an archaeological study shows that past catastrophic natural disasters, such as desertification and land degradation, which were seemingly caused just by population pressure or climate change, cannot be explained by a simple, linear model of causation, but rather these may conceivably be consequences of socio-political actions that spanned centuries having made ecological conditions sensitive to social change (Fisher 2005). In effect, recent climate change has been considered to have been induced by the past and current human actions, on which the AR4 of the IPCC purposely puts emphasis, and the consequences are manifesting in a way that we cannot predict.

There are winners and losers under ongoing climate change and this inequality of climate change impacts cannot be understood by a myopic point of view (Adger et al. 2006). This is one of the important themes running through this dissertation.

Human–environment relationships from a viewpoint of change and shocks

By the time I completed my fieldwork in Greenland, anthropologists had gradually produced their works on climate change (e.g. Crate and

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contribute to the sea level rise significantly. In the AR4, the IPCC projected a global sea level rise of 18 to 59 centimetres from 1990 to the 2090s. If this is the case, Bangladesh, where 10 percent of the land is hardly 1 metre above the mean sea level, will be losing quite a significant mass of land, with coastal areas being submerged (Mirza et al. 2003; Kundzewicz et al. 2008). Similarly, the small lowland island in the Pacific Ocean, Tuvalu, where the highest point is only 4.5 metres above sea level, may have most of its land under water (Farbotko 2005; Patel 2006).

Nuttall 2009; Hastrup 2009). I regard anthropological investigation on climate change as a study of relationships between humans and their natural environments from a viewpoint of change and shocks that emerge in their environments. From my research experience, I sensed that a novel change in the environment would make us reconsider humans' relationships to the environment on which they rely. [5] In order to maintain and redesign their relationship to nature, humans shall take steps to negotiate difficulties, hardship, or adversities derived from environmental changes and to adapt to new situations and living conditions. The study of this kind of human endeavour will shed light on our understanding of human–environment relationships.

While I was writing this dissertation in Edmonton, Canada, huge earthquakes hit my home country of Japan in March 2011. Quakes and associated Tsunamis caused a death toll of over 15,000, with approximately 2,800 missing people, as of August 2012 (Japan National Police Agency 2012). Still today, lingering aftershocks and severe radiation leaks from damaged nuclear power plants terrorize Japanese people, mainly in the eastern part of the country. Since this huge natural disaster and associated man-made disasters, national and local governments have been pouring more energy into disaster contingency planning.

Although our society is not determined exclusively by

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[5] Since my Master's program at the University of Alberta, my anthropological research interest has been focused on natural resource management and the sustainability of societies that depend on it (Hayashi 2008). In my MA thesis, I described historical, political, judicial, and sociocultural processes that had enabled Canadian First Nations to engage in forest management, and then focused on a First Nation in northern Alberta to analyze how they had built forestry and forest conservation strategies to negotiate with forest companies and the provincial government. The First Nation's negotiation has been for securing fair access to their forests, and at the same time, this is a measures to regain the ecological integrity of the forests, access to their traditional hunting and trapping grounds, and cultural viability.

environmental conditions, earthquakes, hurricanes, and tsunamis remind us of the menacing power of nature, the vulnerability of our society, and the magnitude of natural threats. Climate change teaches us that humans make an impact on their physical surroundings on which they depend, and in return, the humans may receive unexpected consequences from them. Peterson and Broad (2009) state that climate change has brought anthropologists, who disliked environmental determinism and so had kept away from examining climate and the physical environment in their studies, back to the study of climate and society. It would not be wise to place too much emphasis on the environment, but it is important to factor in environmental factors in an anthropological study on social transformation. Thus, revolving around climate, this dissertation considers what nurtures human–environment relationships – human endeavours to cultivate a future; an understanding of the past, present and future; and values that people have for life in their environment.

Chapter organization

In Chapter 2, I organize theories I use in this dissertation, first by reviewing the literature on Global Environmental Change research. I clarify that my intension, however, is to discuss issues that Global Environmental Change study does not cover. Although this dissertation is on climate change and society, the component dealing with climate change as such does not account for a substantial percentage of this dissertation unlike usual climate change studies. Borrowing the idea of Endogenous Development Theory, I intend to discuss in the rest of the chapters human endeavours to explore possibilities in the course of environmental transformation – namely sheep farming, tree planting, and coping efforts of hunters. I restate

the direction of my research theoretically in the final section.

Chapter 3 explains my research methods and study area. In order to get across the atmosphere I felt during my fieldwork in Greenland, I have added difficulties I had during my fieldwork.

Chapter 4 looks at life in a settlement in comparison to life in a town. In the latter part of the chapter, I take the readers into the sheep farming settlement Qassiarsuk, hoping that this descriptive chapter gives a sense of solidarity shared by farmers in the settlement. Self-reliance is a basis for solidarity in the settlement, and at the same time, self-reliance is indispensable for the creation and development of a sheep farming tradition.

Chapter 5 discusses a spatial/temporal perspective that today's Greenlanders can discover from the landscape of their livelihoods, while explaining the continuity, although intermittently, of human occupancy in southern Greenland. This kind of perspective is necessary to view the current state in relative terms and to envision future possibilities. The chapter covers the span from the settlement to the demise of Norse society and also the beginning of the colonial control period.

Chapter 6 describes a history of the creation of the sheep farming tradition in Greenland with an emphasis placed on "key persons," prime movers who are agents of innovative social transformation. Although the introduction of sheep farming was what Danes thought was good for Greenlanders in the future, Greenlanders gradually took part in the development of the tradition.

Compared to Chapters 4 and 6, Chapter 7 focuses the individuals' endeavour, namely settling and starting their farming occupation in isolated places. It discusses ambitions, frustrations, prospects, failures, and hopes for the future of sheep farmers who live far away from towns and settlements. These relate to values sheep farmers

live by on their landscape.

In a similar fashion to Chapter 6, Chapter 8 takes up another example of the creation of a tradition, namely a series of tree-planting projects. Can an exogenous tradition become a local tradition? Can it possibly take root in Greenland? The answer depends on how Greenlandic individuals can creatively envision their future way of living.

Chapter 9 deals with hunters in northern Greenland, where a warming climate trend is quite conceivable. Although hunters are capable of coping with climatic and environmental change, larger forces that surround the locality discourage local hunters' endeavours to overcome difficulties.

Chapter 10 discusses the way people narrate climate change and why their narratives are different among people.

Chapter 11 concludes this dissertation with reference to the future, including possibilities, prospects, hope, and sustainability.

Incidentally, as far as I have discovered, there is no English literature focused mainly on sheep farming in southern Greenland in the social sciences, except a general introduction to the topic written by Rasmussen (2000). Nor is there English literature on the sociocultural significance of crop farming and tree-planting. I hope these chapters on sheep farming and tree-planting can contribute to the anthropology of the Circumpolar North and local development study.

The people's names used in this dissertation are all fictitious in order to protect their privacy, while the real names are used for the deceased persons. Figures and Tables are placed at the end of each section.

2. Theoretical Background: Understanding Climate Change in the Context of the Study of Global Environmental Change and an Introduction of Endogenous Development Theory

As I have stated in the Introduction, a study of the social implications of climate change is not just about climate alone. Social implications of climate change are a complicated mixture of various processes and conditions surrounding the place in question. Consequently, it is inevitable to examine not only a phenomenon seemingly directly caused by climate change but also broader social, political, and economic processes and conditions that have bearings on the phenomenon. The purpose of this chapter is to draw theories concerning the study of climate change from the existing literature, and then to show the direction of my research on climate change and society.

If one takes a look at the recent literature on social aspects of climate change, he or she will notice that they are full of technical terms and phrases peculiar to climate change research; namely "vulnerability," "adaptation," "resilience," and specific names of systems models. I would like to start this theoretical chapter by organizing the ideas of these technical terms, tracing their roots and definitions and examining their linkage and functions in the systems models; frameworks that are very often employed in the field of climate change research. Special attention should be paid to the later sections where I discuss the strengths and weaknesses of the systems model theory. Although I agree with a recent trend in which

proponents of the systems model theory underscore the importance of the consideration of broader contexts, I will voice dissatisfaction with the systems model theory, arguing for the need of ethnographic and historical approaches and the introduction of Endogenous Development Theory to deepen the level of understanding of the social implications of climate change. This chapter explores my research approach. It does not provide a comprehensive review of all climate change research.

Underlying concepts of vulnerability, adaptation, and resilience

Any researcher engaging in climate change research, to a varying degree, could not avoid noticing a particular trend in the international arena of climate change research. Climate change research has been developing at a very rapid rate, and concepts, research foci, and approaches to climate change research have constantly been developing. As a result, the IPCC has compiled a large volume of academic research, synthesizing up-to-date findings and insights at the time of publication. The literature upon which the authors of the IPCC reports draw is mainly produced in the field of so-called human dimensions of Global Environmental Change.[6]

The field of Global Environmental Change research is an emerging academic discipline. The terminology used within it has come from many scholars from different academic disciplines including anthropology, economics, environmental study, human geography, natural disaster research, political science, and sociology. The IPCC publications appear to have helped the standardization of these terms,

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[6]. By the study of the human dimensions of global environmental change, I mean articles appearing in mainly the journals of *Global Environmental Change: Human and Policy Dimensions*, as well as *Climatic Change*, *Mitigation and Adaptation Strategies for Global Change*.

but confusions and disagreements in the naming, usage, and understanding of the terminology remain.

In this fast-paced growing academic field, leading scholars in the Global Environmental Change research community often review the historical development of key terms and concepts in order to identify the path they should pursue (e.g., Adger 2006; Eakin and Luers 2006; Folke 2006; Gallopín 2006; Janssen et al. 2006; Janssen and Ostrom 2006; Smit and Wandel 2006). Here, I start my literature review of the origins and definitions of vulnerability, adaptation, and resilience.

According to Adger (2006), the concept of "vulnerability" has its roots in the entitlements theory and the study of natural hazards. The entitlements theory was first proposed by economist and philosopher Amartya Sen. Entitlements means the socially, more accurately – legally, defined rights to life-sustaining resources. According to Sen (1981, 1984), a disaster, such as the famine in his study, is not only due to the exposure to natural events such as lack of food, but also due to the failure of exchange of entitlements. A "set of alternative commodity bundles that a person can command [i.e., entitlements]" (Sen 1984:497, with my addition) in the face of natural hazardous events varies from person to person. For example, land owners can produce food directly from their properties, which is called direct entitlements, while peasants only have indirect entitlements, in which they have to obtain consumer needs in exchange of their labour power, with prices of cash crops being variable. This means people with indirect entitlements are more dependent on others for their needs and more vulnerable to social, economic, and political turmoil. Consequently, it may occur that some groups suffer more than others during a famine.

On the other hand, the natural hazards study community proposed the Pressure and Release (PAR) Model (Blaikie et al. 1994;

Wisner et al. 2003). In the PAR model, a social unit (people and the place) suffering from natural hazards is described as being caught by not only the natural hazard event as such, but also by the social situation of the locality. The PAR model captures the social aspect of natural hazards, by illustrating the capacity of a person or a social group to avoid or cope with disasters, which exactly refers to "vulnerability" in the recent literature. This coping ability is determined by the summation of social, economic, and political conditions at levels ranging from the local and regional to the global. Therefore, vulnerability is defined as "the characteristic of a person or group and their situation that influences their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (an extreme natural event or process). It involves a combination of factors that determine the degree to which someone's life, livelihood, property or other assets are put at risk by a discrete and identifiable event (or a series or "cascade" of such events) in nature and in society" (Blaikie et al. 1994:9; Wisner et al. 2003:11). This conceptualization of vulnerability is a form of political ecology to a certain degree. The PAR model clearly formulates the mechanism of vulnerability, which led to the recent conceptualization of vulnerability.

Although the concept of adaptation is a biological one, it has long been an important research focus of social sciences. Within the social sciences, anthropologists were concerned, as early as the beginning of the 20th century, with social adaptation to environmental variability. Spearheaded by Marcel Mauss (1979), the study of Inuit society's adaptation highly adjusted to the harsh Arctic environment remains attractive to scholars of Inuit society (e.g., Nelson 1969, 1981; Krupnik 1993). It can be argued that the more recent pioneers of the research community now dealing with social adaptation to environmental change are ecological anthropologist Roy E. Rappaport and geographer

K. W. Butzer (Janssen et al. 2006). Influenced by the theories of cultural evolution of Leslie A. White and Julian H. Steward on the one hand, and by the ecosystem ecology of Eugene Pleasants Odum, which had just emerged at that time, on the other hand, ecological anthropology rose in North America in the 1960s.

Analyzing human populations in a similar fashion to the ecological analysis of animal populations, Rappaport (1967) calculated energy exchanges among the community, the natural environment, and neighbouring populations in the region. As a result, Rappaport describes a local ritual accompanied by the slaughter of a number of pigs, which helps to regulate the ecosystem by keeping the levels of human and animal activities from exceeding the carrying capacity of the ecosystem. He meticulously revealed that this ritual adjusted ecological variables in the ecosystem with two hundred New Guinea inhabitants, such as carrying capacity, human and animal populations, human nutritional well-being, and frequency of warfare (Messer 2001). (Note that ecological anthropology in the early days assumed the homoeostatic mechanism of ecosystems, in which ecosystems would stay around a single static state regardless of environmental variability.) Butzer (1980) also discusses the concept of adaptation from a wider viewpoint of Global Environmental Change including climate change.

The resilience concept comes from ecology, which deals with the population dynamics of plant communities, animals, the interactions of both, and the management of the ecosystem (Gunderson and Holling 2002; Folke 2006). The influential precursor of the resilience concept is zoologist C. S. Holling, who proposed that "resilience determines the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist" (Holling 1973:17).

Holling (1973) shows the existence of multiple stability domains (or "basins of attraction") in an ecological system and the non-linear nature of ecological processes. At that time, the idea of "balance of nature" was so dominant that natural processes were assumed to organize themselves around a single, stable equilibrium and to proceed linearly. Accordingly, the social sciences inspired by then-newly established ecology were imbued with this static idea (Scoones 1999). However, from the early 1970s, some ecologists, such as Holling (1973), questioned this static, linear, equilibrium-centred view of nature because, as obvious in his example of fish species populations in Great Lakes and insects populations in eastern Canada's forests, natural processes in reality are dynamic, complex, and full of uncertainty and surprise. In the 1980s, this brought about a shift in the traditional view of nature towards a more realistic, complex view (assumption) of the possibility that several, discrete equilibria, to which a given ecosystem can belong, exist (Holling 1971; Pimm 1991).

According to complex systems thinking, an ecological system self-organizes around its current equilibrium state against an external shock, moving through stages between crisis, collapse and renewal, so long as an exogenous shock is below the latitude of the capacity of the system. Once the system reaches a threshold with a shock, however, it catastrophically collapses and flips into another equilibrial state (Holling 1986). In favour of highlighting complexity, non-linearity and non-equilibrial characteristics of nature, social scientists gradually questioned the "equilibrium" thinking (e.g., Scoones 1999). In effect, Vayda and McCay (1975) attacked the preoccupation of the static equilibrium, where nature would self-repair into a single equilibrium, that ecological anthropologists, including Rappaport (1967), had at that time.

Originally, the term "resilience" was used in the field of

engineering, but ecologists thought it was useful to describe the dynamics of ecological processes of animal populations (Dean Bavington per. comm.). In the notion of resilience, "attractor" and the "domain (or basin) of attraction" are important concepts that are originally from the discipline of physics.

An equilibrium steady point is called an "attractor," for which the state of the system will be headed, and an attractor's sphere of influence is called "domain (or basin) of attraction," where the state of a system would tend to remain stable in the absence of strong stresses. Commonly, resilience concerns the degree to which an ecosystem is able to resist exogenous stress and the speed of its returning to an original attractor. On the other hand, in a given system with multiple equilibria, the measurement of resilience is the magnitude of stress to the system that can be absorbed before the system is flipped into another stability domain. In other words, this type of resilience concerns the level of the threshold, below which a system can remain within a given domain of attraction, keeping the values of its state variables within the same domain. The former is called "engineering resilience" while the latter "ecological resilience."

It is this ecological resilience that scholars are currently dealing with when studying the resilience of society in the face of environmental change. Suffice it to say the notion of resilience is defined as "the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedback" (Walker et al. 2004).

The advent of systems models in framing the mechanism of vulnerability

The conceptualization of the three key terms – "vulnerability,"

"adaptation," and "resilience" – pursued different paths of development. However, from the 1990s, these different paths began to converge with the systems models in the field of Global Environmental Change research including climate change research. This organization of the concepts would not have been able to occur without a consolidated effort of various research institutions and networks, such as the International Human Dimensions Programme on Global Environmental Change (IHDP), the Sustainability Science at Harvard University (organized in 2000-01), the IPCC, the Beijer Institute of Ecological Economics (organized in 1991), and the Resilience Alliance (organized in 1999). Quite a few scholars are affiliated with or participating in more than one research network. As a result, these key terms permeated into different research networks, and this facilitated the conceptualization of the terminology and systems models (Janssen et al. 2006).

"Vulnerability" and "adaptive capacity", like two sides of a coin

Among these three terms, "vulnerability" and "adaptation" were closely developed, according to Janssen and others (2006) who researched scholarly networks by scrutinizing the co-authorships citation maps of 2286 publications, between 1967 and 2005. On the other hand, the concept of "resilience" was slightly independently developed. Presumably this is because "resilience" has its roots in ecology with a focus on theoretical and mathematical models, while "vulnerability" and "adaptation" originated from human geography and natural disaster research with a focus on case studies and climate change research (Janssen et al. 2006).

Here I trace a path of the confluence of the terminology in terms of "adaptation" and "vulnerability." In the Third Assessment Report

(TAR) of the Working Group II of the IPCC, social adaptation is defined as "adjustment in natural or human systems in response to experienced or future climate conditions or their effects or impacts" (Smit et al. 2001:882). In reality, the degree of adaptation varies across and among societies.

Even with having the same type of exogenous stress, for example a warming trend in the sea temperature in Greenland cod fishing, it is likely that one community can successfully adapt to the crises whereas another fails (e.g., Hamilton et al. 2000, 2003). Accordingly, the TAR focuses on the fact that the process of adaptation "takes place in a dynamic social, economic, technological, biophysical, and political context that varies over time, location, and sector" (Smit et al. 2001:895). This begs the questions, what is the mechanism of "adaptation" that takes place within the background of the social situation of a community?

The TAR examines the notion of "adaptation" in terms of "adaptive capacity" and "vulnerability" of systems (individuals, communities, or the region in question) to climatic change and variability (Smit et al. 2001). Following this approach, it means that adaptive capacity is the one enabling or enhancing adaptation processes, while vulnerability is the one that hinders a system's adaptation processes.

Vulnerability as a starting point

Upon studying "adaptation," we can approach it from a viewpoint of either "adaptive capacity" or "vulnerability," but the climate change research community has focused on the mechanism of "vulnerability". It can be said that this is because it is more urgent and important for policy makers and planners to understand why and how some

community are more easily damaged by climatic change and variability. The more theoretical reason is explained below.

Conventionally, an assessment of climate change impacts has been initiated with the scientific projections of future climate trends; then moving on to the creation of climate scenarios, to biophysical impact studies, and then to identifying potential adaptive options within the community. In this chain of assessment, any adverse residual effects that come after the process were viewed as vulnerabilities of community. However, this approach is fraught with problems because, even with the latest scientific knowledge, an accurate projection of future climate patterns is hardly possible in the first place (Kelly and Adger 2000). Rather than viewing a final product of an estimation as vulnerability, one should turn his or her attention to the coping and adaptation processes that individuals and the community are actually employing in the face of change.

Reconsider the sequence of events this way (Figure 2-1). There exists the community in question at a certain place with a certain type of vulnerability. When the research community is exposed to external stresses, individuals and households voluntarily choose to execute the bundle of short-term responses (coping strategies), based on the community's conditions and processes, to the situations that threaten their livelihoods (Adger and Kelly 1999). Long-term adaptive

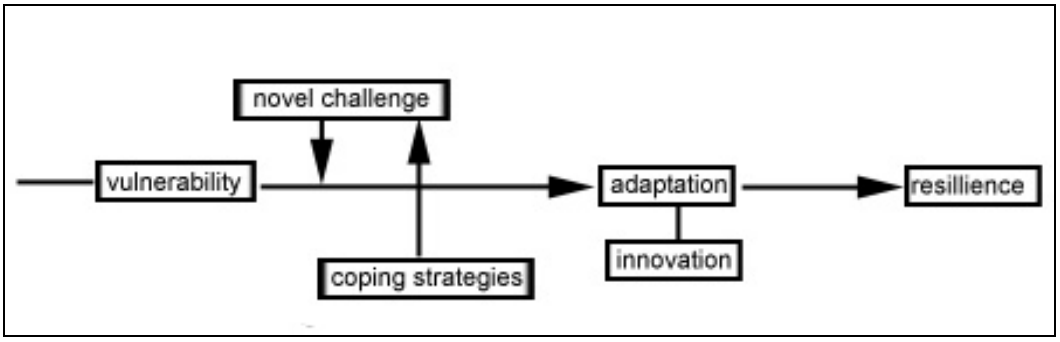

Figure 2-1 The order of process of building community resilience

processes (adaptation) are built on existing effective coping actions. While coping strategies stay within the prevailing rules system, adaptation means changing the institutional arrangements and the livelihood strategies (Adger 1996:29). The resilience of the community (a viable community) will then build up through long-term adaptive processes.

Following this sequence of coping, adaptation, and resilience, we should start with identifying a type of "vulnerability" of the research community. Then, what makes "vulnerability"? Vulnerability consists of societal conditions and processes that reside within the community, prior to exogenous stresses or hazards. Incidentally, the same set of the conditions characterizes the community's adaptive capacity, defining the community's coping and adaptation processes. Therefore, it leads that the study of the human dimension of climate change will become the study of political, economic, technological, and socio-cultural contexts that characterize the community's vulnerability to ongoing climatic change.

Mechanism of vulnerability and systems models

According to the TAR, "vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity" (McCarthy et al. 2001:6, underlines added), with "adaptive capacity" being an element of "vulnerability." Note that it includes not only the nature of the hazards (and the degree of physical exposure to the hazardous event), but also characteristics of a given system (and its capacity to cope with the hazardous event's impacts).

This framing of the concept of vulnerability was further advanced by Turner and others (2003) with the "coupled human–environment

system model" (Figure 2-2). They criticize the PAR model for not paying much attention to the causal sequence of the hazard's structure (i.e., the interactions in the biophysical side) nor the feedback beyond the community in question. Their proposed framework of the coupled human–environment system illustrates:

1) the linkages between human (societal) and biophysical subsystems from lower levels to higher levels,
2) the stresses that emerge from the interactions between these subsystems, and
3) the mechanism of vulnerability of a given system.

In this framework, vulnerability is portrayed as a property of a

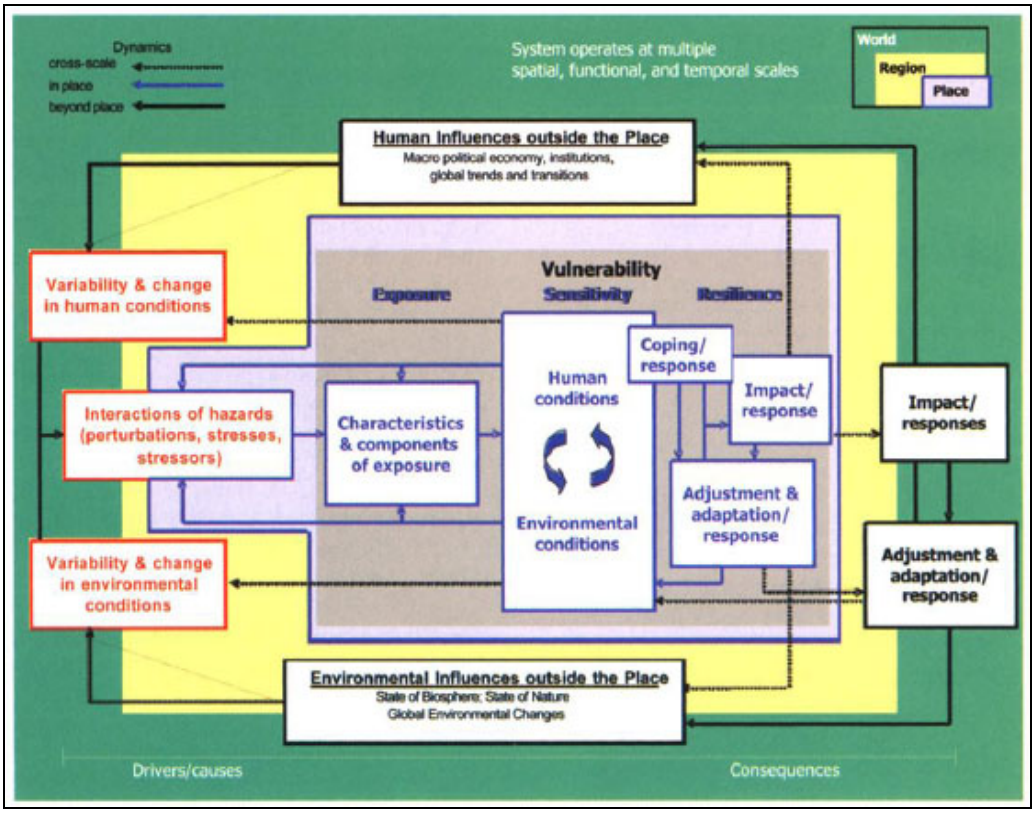

Figure 2-2 The human–environment system model

The model shows the mechanism of vulnerability.
Source: Turner et al. (2003).

coupled system and is defined as a function of exposure, sensitivity to stress, and resilience (coping as one part of "response" and adaptation/adjustment as the other part of "response"). This "resilience" is equivalent to "adaptive capacity" of the TAR (Smit et al. 2001).

Employing this human–environment system model, both the Millennium Ecosystem Assessment (Kasperson and Dow 2005:146-147) and the Arctic Climate Impact Assessment (McCarthy and Martello 2005:951) defined vulnerability in terms of exposure, sensitivity, and resilience. Minor modification has also been made by Barry Smit and his colleagues.

Ford and Smit (2004:393) argue that by putting together "exposure" and "sensitivity" (of the TAR) into one variable, vulnerability becomes a function of the exposure-sensitivity of the system to environmental stimuli and the adaptive capacity of the system. (This adaptive capacity is almost the same as that of the TAR.) Further, this framework was applied to analyze the implication of climate change in the Inuit community of Arctic Bay, Canada (Ford et al. 2006).

A similar conceptual systems model was produced in different academic circles, the Resilience Alliance and the Beijer Institute. They coined "social–ecological systems" in which society and the natural environment on which it depends are coupled into one system, emphasizing the systems' mutual interactions at all scales ranging from the local, and regional to the global (Berkes and Folke 1998; Berkes et al. 2003; Folke et al. 2003). The model was created by the recognition that both the social and environmental components are indispensable for understanding the behaviour and future trajectory of both systems. This circle is significantly influenced by C.S. Holling's (1986, 2001) notion of "resilience" rather than of "vulnerability."

Social–ecological systems approach is the application of non-linear, multiple-equilibrial ecological view of human society. Although the name is slightly different from "human–environment system," these two can be considered synonymous. While the coupled human–environment system was proposed in the framework of vulnerability research, the social–ecological systems model was created in the context of resilience study. Thus, the conceptualization of vulnerability, adaptation, and resilience has developed with the formulation of coupled (or linked) systems models.

Using the 2004 Southeast Asian tsunami as an example, Figure 2-3 in Box 2-1 illustrates social and ecological (biophysical) conditions interacting at the social–ecological systems level at a specific locality. In this context, there are implications from the interactions that range from the local to higher spatiotemporal scales. Conversely, social and ecological conditions beyond the coupled system are affecting the interaction within the coupled system in question. The model helps understand the vulnerability of the place, which can be seen as the confluence of processes and conditions operating at multiple scales (Eriksen et al. 2005). The vulnerability we find at one locality is peculiar to that locality. In this respect, place-based study, or ethnographic field study, is very important to investigate what elements enhance or hinder a local people's adaptation process, how they cope with change, and how they can build resilience of the community.

Confusions and disagreement in the terminology and systems models

The reason why the naming and understandings of the terminology and models vary among scholars lies in the scholarly networks with

which they affiliate.

The systems models

There are multiple different names for systems models. The difference in these names represents scholars' intellectual genealogy. It seems that ideas that couple society and the environment on which it builds were used from early on.

For example, Burnham and Ellen (1979) published their monograph titled "social and ecological systems," and they compile several pieces that question simplistic linear causation and equilibrium ecological models. In the context of Global Environmental Change research, Gallopín and his colleagues (1989) were the forerunners in adopting a coupled systems model named "socio-ecological systems." Then, the "coupled human–environment system" (Turner et al. 2003) was coined by scholars affiliated with the Sustainability Science group of the Center for International Development at Harvard University, such as William Clark, Robert Kates, Elinor Ostrom, B.L. Turner II.

It seems to me that "social–ecological systems" (Berkes and Folke 1998) is most commonly used in the fields of resource (co-)management study (often abbreviated as SES). This "social–ecological systems" model was created through the process of the conceptualization of "resilience" by the Resilience Network, the forerunner of the Resilience Alliance.

The Resilience Network was started by the Beijer Institute and the University of Florida, where Holling worked. The book *Panarchy: Understanding Transformations in Human and Natural Systems* (Gunderson and Holling 2002), which is the summarization of the resilience theory, was an outcome of the Resilience Network (Folke

2006). Accordingly, the members of the Resilience Alliance (e.g., Neil Adger, F. Stuart Chapin III, Carl Folke, Lance Gunderson, C.S. Holling, Elinor Ostrom, and Brian Walker) prefer to use the social–ecological system, and its electronic journal "Ecology and Society"[7] is studded with this term (Resilience Alliance 2002). The term is also used by scholars related to the Beijer Institute of Ecological Economics (e.g., Fikret Berkes, Charles Perrings, and Charles Perrings) (Beijer Institute n.d.). Currently, the name "social–ecological systems" seems prevailing, regardless of scholars' academic affiliations.

Linkages between vulnerability, adaptation, and resilience

There is some disagreement about the mechanism of "vulnerability," "adaptive capacity," and "resilience" among scholars. Gallopín's (2006) diagram is one of the best visual guides for understanding their linkage (Figure 2-4), and I use it in the discussion below. Let's look into the mechanism of "vulnerability." Many scholars include "sensitivity" and "exposure" as elements of "vulnerability" (e.g., McCarthy et al. 2001 ; Turner et al. 2003; Kasperson et al. 2005 ; McCarthy et al. 2005 ; Adger 2006; Smit and Wandel 2006; Adger et al. 2007; Schneider et al. 2007), but Gallopín (2003, 2006) does not include "exposure" as an element of vulnerability because "exposure," he insists, is a property of the relationship between the system and the perturbation, not a property of the system itself. In addition, Barry Smit and his colleagues make "sensitivity" and "exposure" into one variable "sensitivity–exposure" (Ford and Smit 2004; Ford et al. 2006; Smit and Wandel 2006).

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7. The journal "Ecology and Society" succeeded "Conservation Ecology" in 2004.

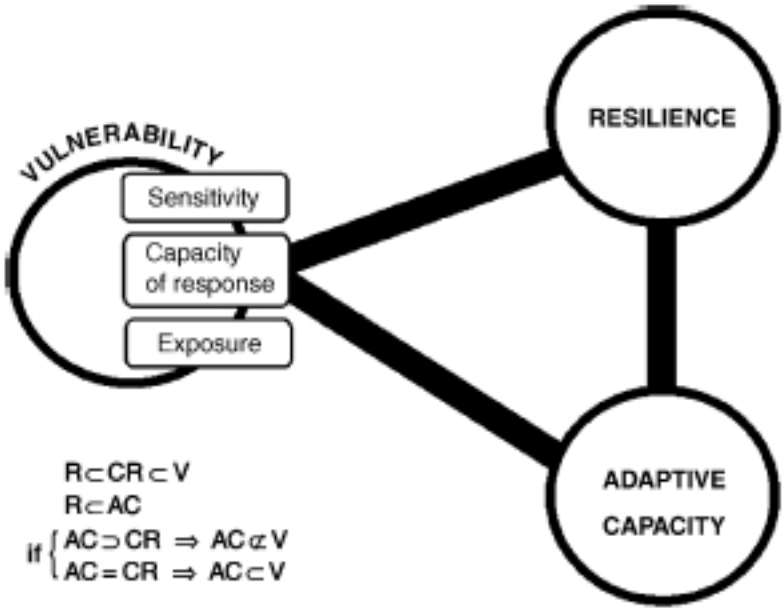

Figure 2-3 Relations between vulnerability, adaptive capacity, and resilience

Source: Gallopín et al. (2006:301).

Also, the interpretation of "adaptive capacity" varies from scholar to scholar. Barry Smit and his colleagues use "adaptive capacity" and "resilience" interchangeably (Ford and Smit 2004; Ford et al. 2006; Smit and Wandel 2006). However, IPCC (Klein et al. 2007) limits the scope of "adaptation" (adaptive capacity) to "coping" (the short-term "response"). Turner and others (2003) see both "adaptation/adjustment" (the long-term "response") and "coping" (part of "response") as elements of "resilience," and further, he defines "resilience" as an element of "vulnerability." Therefore, distinguishing "response" from "adapting," Gallopín (2006) only leaves the "capacity of response" as an element of "vulnerability," but retains the relationship between "resilience" and the "capacity of response" as well as the relationship between "resilience" and "adaptive capacity." Then,

"resilience" should stand as one component of the diagram. It seems clear that the "capacity of response" is connected to "adaptive capacity." Since the IPCC defines "adaptation" as a function of "adaptive capacity" and "vulnerability," "adaptive capacity" should be one component in the diagram.

Important findings concerning the key concepts

From the above discussion on the relationship between the three key concepts, we can draw the following three findings.

Finding 1) Incompatibility of resilience and vulnerability-adaptive capacity

As Gallopín (2006) points out, it is not clear that "resilience" is the opposite of "vulnerability." Measures to reduce current "vulnerability" will not always increase "resilience" to climate-related threats. The concept of "resilience" concerns the system's degree of bouncing back to the original stable state and its regime shift between domains of attraction (stable states). The idea of "resilience" is peculiar to the ecological thinking. On the other hand, the concepts of "vulnerability" and "adaptation" have developed hand in hand in the field of natural disaster research. Therefore, the concept of "resilience" does not seem to fit into the "vulnerability" and "adaptive capacity" concepts well.

Finding 2) Research focusing on coping strategies

In the real world, it would hardly be possible to deal with "resilience" directly nor to measure the degree of "resilience" of the community in question. "Vulnerability" and "adaptive capacity" are relatively easier to conceptualize, compared to "resilience," and are approachable by

identifying "coping" strategies of individuals or communities. Therefore, this finds that the study of "adaptation" starts with the conceptualization of vulnerability, but that it will be through the identification of coping strategies that researchers can portray a picture of vulnerability (and adaptive capacity, ultimately adaptation processes).

Finding 3) Larger forces surrounding the place in question

Relationship between vulnerability and adaptive capacity

Reducing "vulnerabilities" of a community to adverse impacts it experiences will lead to enhancing the community's "adaptive capacity." "Vulnerability" concerns a set of characteristics of the system in question that exist independently of future exogenous stresses or perturbations. At the same time, the same set of characteristics defines the propensity of "adaptive capacity."

On the contrary, improving elements of "adaptive capacity" does not necessary lead to reducing "vulnerability" of the community in question. This is because various factors could impede or nullify the effectiveness of community's initiatives to improve adaptive capacity (Adger et al. 2007). By "various factors," I mean ones generated from the broader social, economic, and political forces that surround the place in question.

Discussion on the findings

As for Finding 1, suffice it to say that the reason why vulnerability and adaptive capacity are easier to picture than resilience is because a set of characteristics of a research place becomes conceivable when exposed to an exogenous shock or a hazardous event (e.g., climate

change).

What concerns me here is the elusiveness of "resilience." This relates to Finding 2 in the previous section. Recently there have been attempts to measure "resilience" in the field of land use study. For example, by employing variables derived not only from ecological indicators but also from social and economic indicators in their scenario models, some researchers attempt to project the degrees and extents of future cumulative effects on the environment and society (Carlson et al. 2003; Schneider et al. 2003, 2007).

In the "resilience" thinking, when the level of an external shock imposed to a system exceeds a threshold, the system experiences collapse but tries to reorganize itself around another equilibiral state. Researchers with scenario models try to express thresholds of systems numerically. Another attempt is inferring a "social" threshold from local residents' reflections of past changes in their environment and to express it as a qualitative form (Christensen and Krogman 2012).

The resilience thinking presupposes several discrete equilibrial states around which a system can revolve to maintain the status quo. However, the idea "resilience" connotes a bouncing back to the stable state from the chaotic state (after experiencing ecological and/or social disturbances) does fit my view of Greenlanders' way of life. As I will discuss in later chapters, I cannot believe Greenlanders' society (communities and people) or the environment try to stay at an equilibrial state.

The Arctic landscape is always transforming and never stays the same. In the ever-shifting environment, Greenlanders always closely observe the situation, and are continuously choosing a next step before it disappears. An option Greenlanders choose allows them to take a step closer to the future they envision, but in next moment they are required to choose another step to get through the difficulties that

never stay in a stable state. Therefore, I cannot help but stand on the side of the vulnerability/adaptive capacity approach, rather than the resilience approach.

Finding 3 is important in that it brings our attention to broader processes, in which local initiatives to cope with climate change are undertaken. It is reported that measures to cope with climate change are seldom undertaken in response to climate change impact alone (Adger et al. 2007:737). Some successful coping processes are seen when the measures are incorporated, or are consistent with other existing, well-established programs, such as water and other resource management, disaster preparedness, land use planning, livelihood enhancement, and development initiatives (Smit and Wandel 2006:289).

This tells policy makers and planners the importance of "mainstreaming" climate change concerns in particular development policies and activities (Huq et al. 2003; Agrawala 2005). To put it another way, in order to evaluate the effectiveness of local coping strategies (towards climate change), it is important to examine if the role of a higher-level organization – such as government – in mainstreaming takes into account broader forces (Adger et al. 2007).

A research approach derived from vulnerability research and the need of Endogenous Development Theory in this research

In Global Environmental Change research, a research approach focusing on "vulnerability" is often called "vulnerability research." I will discuss the strengths of this approach and illustrate the lessons that are useful for my research project. Then I will discuss the weaknesses of vulnerability research (how I compensate these weaknesses with ethnographic approach will be discussed in a later

chapter). In the last section I introduce Endogenous Development Theory in order to analyze the still-remaining problem of the conventional climate (environmental) change research.

Useful approaches extracted from the strengths of the vulnerability research

First, one of the achievements of Global Environmental Change research is that it has unravelled the mechanism of vulnerability of the system in question (a research community). It defines that vulnerability is, among the characteristics of the human-environment system in question, the degree to which the system is unable to cope with adverse impacts of climate change (Schneider et al. 2007). Accordingly, it is clarified that vulnerability exists within a community, prior to exogenous stresses and perturbations. At the same time, the propensity of the system concerning vulnerability is also decisive to the degree of the same system's adaptive capacity.

Second, this definition of vulnerability places "vulnerability" at the beginning of an adaptive process – starting from the prior existence of "vulnerability" within the system, having "exposure" to stresses, moving on to "coping," and finally to "adaptation" (Figure 2-1). This arrangement allows climate change researchers to start their research from the identification of vulnerability. Concerning this point, "vulnerability" as a starting point has an anthropological significance. Since "vulnerability" is not an end product in this arrangement, but the starting point from which people make an effort to improve their system, we can avoid seeing people as "passive actors", who are merely vulnerable to a changing climate (Duerden 2004). This relates to what Ortner (1984) means by positive "agencies," in which humans are socially and culturally conditioned

actors in a certain society, yet they can manipulate their culture in pursuit of solutions to their problems and to achieve the perceived ideal of their society. This point relates to a discussion on Endogenous Development Theory in the end of this chapter.

Third, it brings researchers' attention to coping strategies of the community in question or individuals. The identification of coping options that a community has will allow researchers to inductively reason the vulnerability and the adaptive capacity of the research community. In effect, what researchers can deal with during a year-long fieldwork may be coping strategies of communities and individuals.

Fourth, vulnerability research illustrates the complexity of the interactions between society and the environment on which they depend and the nested scales of the vulnerability problem. In addition, stresses, perturbations, and uncertainty emerge from broader processes and conditions surrounding the system in question. Indeed, "uncertainty" is what was missing in the conventional research framework, particularly in the field of resource management, where everything is supposed to be manageable (Ludwig et al. 1993).

Therefore, we can see from the above that the method of fieldwork in climate change study is to examine the vulnerability of the community and individuals through the identification of their coping strategies. In addition, we should be aware of broader human and environmental conditions and processes that may affect the community in question.

This is because social, economic, and political processes and conditions within and beyond the community (system) are affecting the community's responding (coping), interacting with environmental conditions at all scales. Accordingly, larger forces, such as global economy and international politics, may hinder or even nullify local

people's coping strategies. Researchers engaging in adaptation study may need to pay attention this point.

Weaknesses of the vulnerability approach

One of the weaknesses of vulnerability research is that while systems models are elaborated to recognize the complexity of the ecosystem, the human/societal component of this model appears far too mechanistic, paying scant attention to such uniquely human attributes as free will, ingenuity, and fortitude. Systems models try to eschew simplistic, linear causation relations; however, they are too reductionistic, compared to the real world (e.g. Bavington 2010). After all, systems models are useful and convincing for policy makers and resource management planners, as it conceptually renders the complex nature of climate-change-related impacts manageable and operational. I raise four issues that need to be addressed.

First, more attention needs to be paid to the political situation of the community in question in climate change study (vulnerability research) – I discuss this in Chapters 9 and 10. In this respect, political ecology helps us pay attention to the complexity of the environmental change processes that result in social problems through political/social institutions, such as local rules of land ownership and resource management. In political ecology, political/social institutions are viewed as mediators between pressures stemming from the place of study and a shock and its perturbations that impact the local ecosystem (Wolf 1972).[8] Therefore, it is necessary to scrutinize the mechanism in which political power relations may encourage or

[8] Yet, one of the cautions concerning political ecology is that it is liable to put too much emphasis on social factors, paying less attention to the causality in the natural environment (Zimmerer 1996).

discourage people's actions, behaviour, and ways of thinking in the course of adaptive processes throughout the environmental change – I discuss this matter in Chapter 9.

Second, climate change study (vulnerability research) fails to include people's perception in its research framework (Adger 2006). It is important to study how people perceive the current state and hold a view of the future with reference to the past – I discuss this in Chapter 5 – and how people address their concerns under the political, social, and economic position in which they are situated – I discuss this in Chapter 10.

Third, the systems model lacks the notion of time and history. Social and environmental conditions and processes are perpetually in motion. Accordingly, we need to keep updated with what is happening in the actual systems. For example, we can compare the state of a systems model at two time points A and B. The two states A and B only show a snapshot for one moment in time. If it is likened to calculus, we have just differentiated an equation at two points with respect to time, and know two partial shapes of the equation from slopes of the tangent at the points. In the world of calculus, we can theoretically differentiate an equation at infinite points between A and B to know the entire shape of the curve, but it is not possible to do the same thing in reality. After all, it is not possible to have an infinite number of images of the systems model. Therefore, the model is a bit one-dimensional, pertaining to the temporalized phase, ignoring life history and the rhythm of a life. In Chapter 4, I incorporate the perspective of the passage of time – that is, a history – into an examination of cultural landscapes in southern Greenland.

Fourth, the nature of the model presupposes that the systems are situated at a fixed, permanent locality. Yet, just by thinking about the rise and fall of settlements in southern Greenland (see Chapter 7), one

can realize that people are actually mobile, migrating in and out to seek a place that may have a more attractive future. Moreover, even though one community became desolated, which was the intention of the residents, the people can still find a better life in a different place. In other words, people try to make their lives viable by perpetually making decisions about leaving or settling in a community. This model fails to consider the influx and outflow of the population that can be determined by residents' senses of place, images of place, and prospects. Therefore, this model is more for place than for people.

Endogenous Development Theory

I have brought up, in the above section, issues with which vulnerability research fails to deal. In order to address these issues, we need a research approach other than the vulnerability research approach. What I would like to analyze in this dissertation is processes where people endeavour to create a tradition in order to cope with problems arising from their social or environmental conditions and to build better lives in the future. By the creation of a tradition, I mean the sheep farming and tree planting that I discuss in Chapters 6 (and 4 and 7), and 8, respectively. In order to analyze these, I introduce Endogenous Development Theory.

In her theory, Japanese sociologist Kazuko Tsurumi defines endogenous development as a process of the creation of conditions, in which people of a locality can freely seek to realize their own possibilities (1989:49; 1996:9). In theory, locals endeavour to create a community where they can realize alternative ways of life they have envisioned. The form of the community they want to create and the process of its creation are autonomously determined according to environmental conditions, cultural heritages, and historical conditions

peculiar to the locality. External knowledge, technologies and systems also significantly inform this creative process. According to Tsurumi, this kind of social transformation is promoted by "key persons." Tsurumi (1989:59, 1996:214) defines key persons as those who would undertake suffering for the creation of traditions, and would think of and/or implement what would not likely happen otherwise. Key persons intend to reduce "irrational" burdens; those for which a group of individuals are not responsible but keep happening even when the people want to seek future possibilities. While key persons in the process of endogenous development are agents of gradual changes in everyday life in a local community, they are not necessarily revolutionists (Tsurumi 1996:215).

Tsurumi's Endogenous Development Theory is an antithesis to developmental theories formulated in the 1960's American sociology circle. According to them, developed Western countries, such as the United States and the United Kingdom, developed endogenously, while non-Western countries developed exogenously, borrowing forms and types of development from Western developed countries (Parsons 1961). Tsurumi argues for autonomy and self-reliance of developing countries.

Furthermore, she emphasizes that agents of social transformation (i.e., endogenous development) are individuals with creativity and ingenuity, and are those who pursue the betterment of spiritual life, as opposed to materialistic life. In this respect, her perspective is with individuals, their everyday life, and their relationship to society (community).

To clarify, Tsurumi defines community as a small, sizable group of people at a specific locality, where a sufficient amount of human resource is available and where inhabitants of the place can participate in decision-making process in pursuing a better life in the

envisioned society. To my knowledge, Tsurumi's focus is on individuals who have a developed creative capacity and innovative nature. Accordingly, as chapters go on, my focus moves to individuals from communities. As for my use of the word community, I explain at the beginning of Chapter 7.

In recent years, "endogenous development" is in discussions about development of local communities in Europe (e.g. Low et al. 1995; Ray 1999; Jenkins 2000; Schuksmith 2000; Ploeg and Renting 2004). Although, different academic disciplines draw on endogenous development they share a common concern for concepts that emphasize local knowledge, a bottom-up approach, and participative processes.

Concluding remarks: anthropological intervention in climate change study

In the social sciences, there has been a change over the last couple of decades in their approaches to human–environment (society–nature) relationships, moving away from an emphasis on the culture–nature dualism towards looking at the dynamism of the interactions between humans and the environment both within and beyond a society (e.g., Descola and Pálsson 1996). Some scholars attempt to trace this shift with the advent of ecological anthropology which examines the interaction of social and ecological systems as a functional whole (Scoones1999). In any case, human–environment relationships have been increasingly examined from a holistic and integrative point of view, which takes into account history (e.g., Cronon 1996), the role of human agency in the social system (Ortner 1984), and the complexity of the interactions with the scalar nature of processes and conditions ranging from the local to the international (Berkes et al. 2003). The study of human–environment relationships from a viewpoint of change

and shock has been drawing more and more attention from scholars.

Since Global Environmental Change research is a problem-solving type of research, with a view to serve policy making and decision-making processes, its research framework tends to be schematic and reductionistic. We cannot understand human affairs and society properly until we examine the issues I have raised in the previous sections – people's free will, ingenuity, innovative nature, fortitude, perspective to grasp the present state, and endeavour to create a tradition to overcome difficulties. Therefore, in the rest of my dissertation, while using ideas of vulnerability research such as vulnerability and coping, much focus is placed on the research of locals' human nature, endeavor to overcome difficulties, and their perspective towards ways of life and the future and the larger forces that encourage or discourage their effort. That is, I deal with self-reliance of individuals as a basis for solidarity in community and for key persons in the creation of a tradition in Chapter 4; a temporal/spatial perspective in Chapter 5; endeavor to create a tradition in Chapters 6 (sheep farming) and 8 (tree planting); Inuit values as a basis of locals' pursuit for the betterment of spiritual life in Chapter 7; larger forces to hamper locals' creativity in Chapter 9; and differences in ways of holding a view of the future in Chapter 10.

Box 2-1 An example of the social-ecological system model

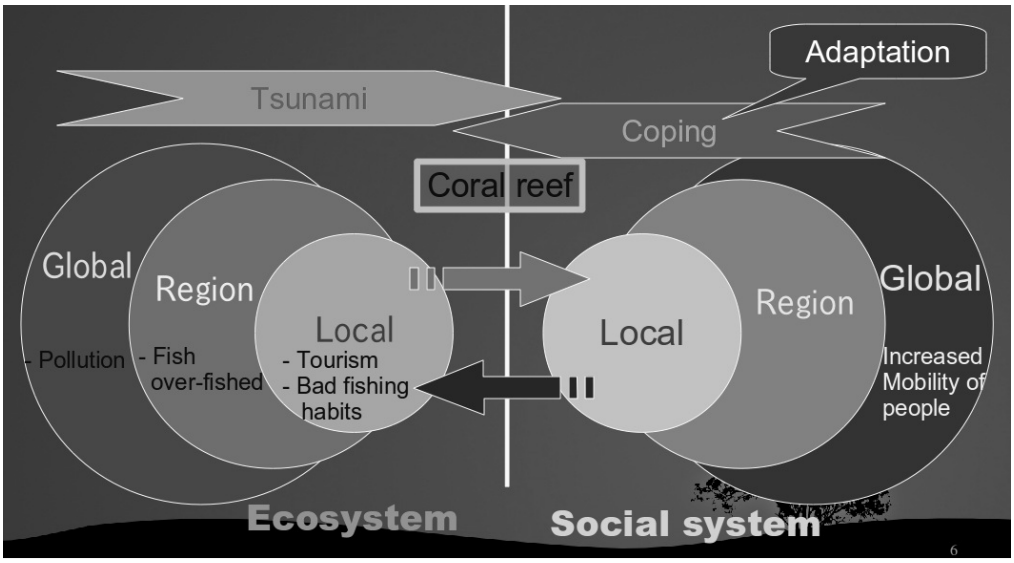

Figure 2-4 The social-ecological system model and its application to the 2004 tsunami case (drawn by the author)

The use of this model makes it easier to discern the complex structure that a shock, such as a natural disaster, brings to a community and also helps to determine remedies for the system's vulnerabilities. For example, the damage from the 2004 Southeast Asia tsunami could have been reduced if healthy coral reefs had been in place in coastal zones (Adger et al. 2005). Unfortunately, these coral reefs had already deteriorated and provided few barriers from the waves for coastal zones. With increased mobility and global tourism, many tourists had visited the coastal region and damaged the local ecosystem. The regional ecosystem was deteriorated by human activities including over-fishing of herbivorous fish, destructive fishing practises such as bombing and poisoning, run-off from the land, and chronic pollution that caused a decline in water quality. All of these negative factors caused occurrences of algal blooms and fleshy

seaweeds turfing over coral reefs, which prevented the regeneration of the reefs. Later on, international aid organizations tried to replant coral reefs in the coastal zones, but their attempts were unsuccessful. The appropriate action would be to make efforts to improve water quality, to maintain adequate herbivorous fish stocks (thus preventing algal blooms and seaweeds), and to put regulations in place to stop destructive fishing practises. The building of resilience of the human-environment system is key to reducing the impacts of tsunami and to reorganize communities in the coastal zones. As for the human side, it is important to make institutions (rules and organizations) in order to promote collective actions, to establish robust governance structures, and to diversify livelihood options available to local farming and fishing communities. By so doing, coastal communities will be able to adapt to the tsunami-hitting environment. Information exchange, the strengthening of social cohesion, and mechanisms for collective action will all enhance resilience and will guide the preparation for future environmental change. Also, this model encourages us to pay attention to the relationship between the reduction in livelihood options for local people and the degradation of the local environment, through deforestation of mangroves in the shoreline. Liquidation of mangroves are often done in favour of intensive shrimp farming. This changes, to a great extent, the local environment and livelihoods of farmers and fishermen, and results in providing no natural barriers for coastal communities. Shrimp farming is a lucrative export industry and its demands are from the outside of the system of study. In this way, various processes operating at different levels intersect at the local level, and dictate the degree of damage from the tsunami.

3. Ethnographic Research Methods and the Localities in Question

The literature review in the previous chapter has shown that identifying individuals' and communities' coping strategies will guide us through understanding a set of characteristics that determine the degree of vulnerability of the place in question. It leads that whether individuals and communities are capable to adapt to future climate conditions and whether it has a great potential for development in the face of climate change may be unravelled through the ethnographic examination of vulnerability of the research place.

If I had focused my research on a schematic type of vulnerability research, this approach would have been perfectly fine. However, as the theoretical review in the previous chapter shows, I moved away from the approach of vulnerability research. Further, once I started my fieldwork in Greenland, I stopped following this approach altogether. My focus shifted to the historical processes from which the current local conditions came and the future of Greenlanders' lives – that is, how people built their lives, how they are maintaining and perceiving the current state, and how they try to cultivate a future. This chapter describes my ethnographic research methods and the geographical and historical setting of the places in question, and, at the same time, is a record of the trial-and-error adjustment of my approach towards climate change study in Greenland.

Map 3-1 Major towns and administrative divisions in Greenland

Town names during the colonial era (from the 18th century to 1979) are shown in parentheses.

Ethnographic research Methods

This dissertation largely draws on the ethnographic data I gathered during my fieldwork in Greenland, with secondary sources to supplement my field data.

Where I lived and the places I visited for my fieldwork

My fieldwork spanned 13 months, from 2008 to 2009. I lived in the town of Qaqortoq, southern Greenland, with my wife, and spent most of my time there (Map 3-1). It is located near the end of the narrow land between the fjords, stretching out towards the Labrador Sea. There are two towns in southern Greenland, which are officially called "town" other than Qaqortoq. Narsaq is north of Qaqortoq and Nanortalik is located down south. Narsaq is facing the Tunulliarfik (Eriks Fjord), and at the far corner of it is the Narsarsuaq international airport.

The places I conducted my fieldwork included Qaqortoq, Narsaq, Narsarsuaq, sheep farms between Nordre Sermilik (Isafjord) in the north to Tasermiut Fjord in the south, and Saarloq (a settlement belonging to Qaqortoq) from southern Greenland. I was able to stay with one family in the Qassiarsuk area for three weeks in September 2008, and with another family in Qorlortukasik for two weeks in January 2009. In addition, I visited Nuuk, western Greenland, and Qaanaaq and Siorapaluk, northern Greenland.[9]

[9] Since I devote a significant portion of Chapter 9 to the description of the geographical and historical background of northern Greenland, here I only write about southern Greenland.

Planned Interview methods

Methods I employed during my fieldwork include participant observation and formal and informal interviews with local people. Fishers and hunters nowadays live in towns and settlements, as opposed to nomadic life in the past, and sheep farmers live in neighbouring settlements and isolated places in the deep fjord landscape (as for difference between settlements and sheep farms, see Table 4-1). Visiting these places from Qaqortoq, I continued participant observation and interviews.

In a formal interview, I set up a place for interviewing, usually at an interviewee's place or a public space, such as a fish processing company's canteen, explained the purpose of my interview, and taped our conversation with my voice recorder with interviewees' verbal consent. During the interview, I took notes to make sure if spellings and my understanding of the words and phrases were correct. In most cases, I used a translator for a formal interview, but there were times when I did not use a translator. I transcribed most of the taped conversations. When I conducted an interview without a translator, I asked the interviewee(s) to allow me to have a third person listen to the taped conversations when transcribing. When I had words and phrases that I could not transcribe, I asked my Greenlandic friends to help me transcribe the interviews.

Additionally, there were informal interview such as everyday conversations and chatting. These were not taped. I visited some 25 sheep farms out of approximately 50, and have relatively long conversations with more than half of the farmers in the form of interviews or participant observations. I talked to approximately 15 hunters/fishers from southern Greenland and nine hunters from northern Greenland. Yet, the number of people I talked to and

chatted with about climate change was much larger.

Archival research

As for the second-hand source, I used TV and radio programs (i.e, *Kalaallit Nunaata Raidoa*, KNR, Greenlandic Broadcasting Corporation) newspaper articles (e.g., *Atuagagdliutit/ Grønlandsposten* and *Sermitsiaq*), and films. After my fieldwork, I used Greenlandic and Danish journal articles and books to learn local histories of Greenland's towns and settlements to supplement my field data.

Reflection of my fieldwork

This section is a reflection of my fieldwork and I hope to get across how I carried out my fieldwork for 13 months.

Change in the way I interviewed

At first, I was eager to solicit farmers and hunters for their perceived changes in the environment and their coping strategies to them. However, it soon turned out that this approach did not work as effectively as I expected. Coping strategies, if anything, are taken up by those who think of change as change, and people who do not see any problem would not conceive of any coping strategies. Because of the ever-shifting nature of the Arctic environment, what outsiders like me think is change did not seem to change for them (see Chapter 10 for further discussions).

To give one example, the weather of southern Greenland is marked by high winds and sudden changes in the wind direction (see Chapters 4 and 8). When the wind blows from the northwest, the

temperatures may drop to below freezing, bringing in snow. Then, wind switches directions to come from the northeast in several days. When this wind blows, the temperature climbs significantly. This wind is an equivalent to a Chinook on the eastern side of the Canadian Rockies. During my stay in Qaqortoq, there was a day in January when the temperature soared from ten below to five degrees in a short time. Rapidly, snow melts, streets change from white to black, and occasionally it rains. Then, it may snow again due to a returning northwest wind. Sudden and drastic changes in wind direction or speed occurred all through the year of my stay, and I observed that this pattern was particularly prominent from November until February.

The town of Qaqortoq receives electricity from a hydroelectric station at Qorlortorsuaq (literally meaning "a big fall"), which also supplies electricity to Narsaq and Nanortalik (cf., Map 7-1). During the winter, hydroelectric turbines would often freeze, and hour-long blackouts occurred several times. Yet, since it was common for Greenlanders to use candles for ornaments, presumably by a Danish influence, almost every house had candles in the dining room, and many people seemed to manage this kind of trouble well. Therefore, while the ever-shifting, harsh weather and associated difficulties truly affected locals, the difficult conditions are part of their everyday life.

That said, some people raised concrete examples of changing climate. For example, a retired sheep farmer at Qorlortorsuaq pointed to the mountains over the big fall and told me that an ice patch on the slope had disappeared very recently. However, when it comes to a question whether such a change in their environment really affected their lives, the answer varied. Among farmers, some expected positive effects of a warming climate trend while others were worried about the negative consequences of climate change. Some fishers and hunters addressed their concerns about difficulties caused

by changing weather conditions while others had no worries about climate.

What I remembered most from the interviews was that when asked a question about climate change by me as a foreigner, some became embarrassed as if they were thinking, "Not again…" They knew climate change in Greenland had been extensively quoted in the media outside Greenland. As I discuss in Chapter 10 in detail, some interviewees just reiterated clichés that were seemingly heard elsewhere and, did not represent what they thought. Some seemed embarrassed by my questions because they did not have any concerns about climate change.

Even under the fluid, harsh, unstable Arctic environment, anomalies in the weather conditions and extraordinary events, such as a heavy rainfall in fall or a dry summer, remain deep in their memory. Yet, these facts just represent dots on a temporal axis, and were never connected with a line. They did not portray Greenland's society in the course of climate change.

At the very early stages of my fieldwork, it already became clear that just asking about climate change would do little progress my research. The purpose of my study was describing Greenlanders' lives and their relationship to their environment from a viewpoint of "change." Consequently, at some point, I stopped emphasizing climate change when asking questions to my interviewees.

Rather, my questions turned to their life stories, the past and present state of their lives, and how they had pursued their livelihood. Only occasionally did I ask about climate change and what they felt was a problem in their lives. This way, I was able to grasp a big picture of Greenlanders' lives in the historical process of human affairs and climate fluctuation, not simply in the recent global climate change. I gradually learned what I reviewed in the previous chapter about

broader conditions and processes, and the importance of learning a history of localities. The reality is not so simple. In effect, many conditions other than climate change impact a research place. Consequences apparently caused by climate change may be only the visible tip of the iceberg reflecting a complex mixture of social, political, and economic conditions of the research place.

In this way, I changed a way of asking a question in formal and informal interviews, avoiding emphasizing climate change. It is as if I was assembling a large jigsaw puzzle named "Greenland" and I was searching for where I can fit one piece called "climate change." In other words, I needed to situate climate change issues in a broader societal context. Otherwise, I would not be able to describe Greenlanders' lives in the face of climate change.

Difficulties

My fieldwork in Greenland was a very hard task. The problems I had during my fieldwork included difficult access to research places, languages, and fickle weather conditions. The reason why I describe my problems during my fieldwork is that these issues help portray what a life in Greenland looks like and also relates to the latter part of this section.

Access

In Greenland, human habitations are sparsely distributed along the shorelines. Greenland is the world's largest island, with the landmass of over 2.1 million square kilometres. Since a majority of the land is covered by an ice cap, the inhabitable space is limited to the coastal area of 410,449 square kilometres. Even on the limited ice-free area,

however, the population was only 56,615 people – the majority of whom are Inuit, with a minority of Danes – as of 2011. Accordingly, the population density is as low as 0.14 per square kilometres (Statistics Greenland 2011).

As is the case throughout Greenland, there are no roads connecting one place with another in the south of the country (the only exception is a road between Ivittuut and Kangilinnguit). The only means of transportation is by boat, but there are only a few places where regular sailing lines are publicly available. Many sheep farms are sparsely distributed along the shorelines of fjords, far from towns, and outside the public sailing lines. Accordingly, visiting sheep farms requires hiring a hunter/fisher to take a boat through the complex topography of the fjords, and this is an expensive undertaking.

The beauty of living in Qaqortoq is that the town is an administrative centre of the southern district of Greenland. There is the Agricultural Advisory Office at Qaqortoq. Despite the absence of sheep farms in town, the fact that the Agricultural Advisory Office is located at Qaqortoq is for historical reasons (see Chapter 6).[10] During the summer, the officers from the Agricultural Advisory Office were scheduled to sail around the fjords to visit sheep farms, and fortunately I was permitted to accompany them. Without their help, it would not have been possible to visit so many sheep farms and to become acquainted with the sheep farmers.

The role of the officers was to give agricultural and sheep breeding technical advice, and to mediate between Nuuk and sheep farmers. A farmer who makes a new hayfield will be subsidized by

[10] Until a couple of decades ago, there were some sheep farms located at the northern and the eastern shorelines, just over the hills surrounding the town, but the townspeople were unhappy with sheep wandering around the town freely. I heard that some disputes arose between the sheep farmers and the townspeople. Since then, there have been no sheep farms around Qaqortoq.

the government on the condition that his planned field is surveyed. In addition, the officers deal with the procedures regarding subsidies accrued from purchasing cultivating machines and fodder, the transfer of land ownership, and inspection (auditing to see if farmers observe regulations and to check the accuracy of the reported numbers of sheep). At the time of my research, many sheep farmers were working on the expansion and the creation of their fields and as a result, a surveyor was always with us.

Language

Although the officers were on business trips when they visited farms, not acting as a guide for me, I was permitted to enter farmers' houses by accompanying the officers. This opened doors for me and allowed me to make local contacts.

At the beginning of my fieldwork, it was difficult for me to just sit, stand around, or wait idly by listening to a local language I had no knowledge of, when there were so many things I wanted to know. All I could do was wait until after their meetings to introduce myself to the farmers through the officer's translation. I sometimes asked the officers for interpreters who spoke English in interviewing farmers, but I did not have the nerve to ask them every time. Even so, it was difficult to find a Greenlandic-English interpreter who could assist me. If any, I could not take such a bilingual person along to farms, taking up his or her time for me.

For these reasons, I felt an urgency to learn Greenlandic as quickly and as effectively as I could. Before I went to Greenland, I learned to read Danish at my university. During the summer 2008 in Qaqortoq, I devoted myself to learn Greenlandic grammar with a textbook written in Danish that I borrowed from my Greenlandic

friend.

However, there are not many learning materials for Greenland. The existing dictionaries do not cover a large volume of vocabulary. During my fieldwork, I was forced to keep learning Greenlandic not only from dictionaries but also from everyday conversation. This was a hard work for me.

After I slowly learned to speak the local language, I purposely tried not to ask the officers for interpretation as much as possible because I sensed that there would be some things that the farmers would find it difficult to talk about in front of the officers and because I was afraid of the occurrence of a conflict of interest between them. After I made some Greenlandic friends in town, I occasionally asked them to assist me for my interviews. As I have stated above, occasionally I conducted an interview alone. There was a time when it took one hour and a half just getting across my three questions to a fisher and understanding his answers. I sincerely thanked his patience with me and with my Greenlandic.

Although my Greenlandic was clumsy, the fact that I spoke the language changed my relationship to Greenlandic townspeople. Greenlanders have a high percentage of mixed heritages, particularly Greenlandic-Danish, which is reflected in physical appearance. It often surprises visitors with no knowledge of Greenland when a Caucasian-looking person begins speaking Greenlandic and self-identifies as a Greenlander. It seems that what makes a person identify as a Greenlander is a competency in Greenlandic. Accordingly, even Caucasian looking Greenlanders who speak Greenlandic are regarded as Greenlanders, while those who do not speak Greenlandic are hardly accepted as Greenlanders.

Danes have been present in Greenland since the colonial period, but most Danes do not speak Greenlandic. Danish has been used in

the school system and many Greenlanders are fluent in Danish, which discourages Danes from learning Greenlandic. In such a society, a Japanese person struggling to learn Greenlandic was apparently a novelty.

There were many times when my few utterances in Greenlandic made the people smile. Probably the fact that I look like a Greenlander helped me. When I visited Nuuk in spring 2009, I was interviewed in Greenlandic by a local radio reporter whose program featured me as a foreigner who speaks Greenlandic. When I returned to Qaqortoq, many townspeople already knew I had been on the radio. I felt like my face burned with shame because I thought my Greenlandic was not so great, but they appreciated my effort in speaking Greenlandic. My appearance on the radio show even helped me get integrated to local people.

Competency in Greenlandic seems to form one pillar of the mixed heritage. There was always a debate about whether they should call themselves "Inuit" or "Kalaallit" (Gl., Greenlanders). An interesting, persuasive opinion was that they are actually a mixture of Inuit and Danes, which makes them "Kalaallit." As the language is so significant for how they identify themselves, learning their language became an important factor in my research.

Weather

Another problem was that Greenland's fickle weather very often thwarted my sailing plans with high winds and storms. The weather ended up testing my patience. I came to realize an anthropologist needs to be able to keep a fairly even temper through difficult times and not get angry at whatever happens. Above all, the experience taught me about the nature of anthropological research in both theory

and practice and going through the process allowed me to gain a better appreciation for anthropologists.

My discussion based on fieldwork and archival research starts from next chapter onward.

4. Life in a Settlement as Opposed to Life in a Town: Sheep Farming as "An Arduous Livelihood"

There are two administrative terms to refer to human habitations in Greenland: "town" (Gl. *illoqarfik*) and "settlement" (Gl. *nunaqarfik*). Over 80 percent of the population cluster in in towns (Table 4-1). While many townsmen engage in administrative and business occupations, most settlements base their livelihoods on hunting and fishing. They are small-scale fishers and hunters. (There are also small-scale fishers and hunters in towns.) Among the settlements, there are only two with economies based on sheep farming: Qassiarsuk and Igaliku, with their populations being 48 and 31 respectively as of 2011 (Table 4-1).

Table 4-1 Population distribution by habitation in Greenland in 2011

Habitation	Population	(%)
Town (Illoqarfik)	47,857	(84.5)
Settlement (Nunaqarfik)*	8,239	(14.6)
Station	325	(0.6)
Sheep farm (Savaateqarfik)**	172	(0.3)
Unknown	22	(0.0)
Total	56,615	(100.0)

(Source: Statistics Greenland 2012)

The Greenlandic word for each type of habitation is put in parentheses.
* Among settlements, Qassiarsuk (population 48) and Igaliku (popl. 31) are the only settlements primarily engaged in sheep farming. Other sheep farmers' habitations are categorized into "sheep farm" in the table. The focus of Chapter 2 is on Qassiarsuk as settlement while the focus in later chapters is placed on "sheep farms".
** Qallimiut, Qorlortukasik, Timerliit, and Eqaluit akia are examples of this.

In Table 4-1, the entry "sheep farm" refers to those not located within Qassiarsuk and Igaliku. They dot along the shorelines of the fjords, separated from each other by large distances. Both sheep farming settlements and sheep farms (ones other than settlements) are very isolated from towns or other human habitations. While life in a town is rich in material things, life in a settlement or on an isolated farm is characterized by an extremely low population, scarce commodity endowment, and inconvenient transportation. People living in a remote place may be highly vulnerable to social and environmental change. Still, they choose to live in settlements and isolated places.

Statistically speaking, the population of sheep farmers' families is a total of farmers' families in settlements (48+31) and those in isolated places (172). That is, there are only 251 people. This figure accounts for less than 0.5 percent of Greenland's population. While they do not represent a majority of the Greenlandic population, my intent is to illustrate only the lives of these sheep farmers and small-scale fishers and hunters in settlements. The reason for this is analysis of their lives will clarify Greenlanders' value for life: how they try to construct their lives in the world of environmental, political, economic and sociocultural transformation and how they envision the future. While I deal with sheep farmers' lives in isolated places in Chapter 7 and hunters in northern Greenland in Chapter 9, in this chapter I deal with life in a sheep farming settlement, as opposed to town life. From the analysis of life in a sheep farming settlement, I hope to demonstrate what it takes to be a sheep farmer – self-reliance.

Life in a town

I will begin with Qaqortoq, where I lived, as an example. Qaqortoq

has a population of 3,304 as of January 2011 (Statistics Greenland 2012). This figure may give the impression that this town is located in the "countryside," but Qaqortoq is the fourth largest town in Greenland. In January 2009, the administrative restructuring created the southern district of Greenland (Kommune Kujalleq) by putting together the three municipalities of Qaqortoq, Narsaq, and Nanortalik, and made Qaqortoq the capital of south Greenland. With this, Greenland is divided into four districts: Sermersooq (the transverse strip of the lower part of the land, including Nuuk), Qaasuitsup (the upper part of the land), Qeqqata (the western side of the middle part of the land), and Kujalleq (south Greenland), as shown in Map 3-1.

Previously, Greenland was divided into three "country parts" (Dan. pl. *landsdele*; the primary administrative divisions): East Greenland, North Greenland, and West Greenland. Furthermore, East Greenland was divided into two municipalities (Dan. pl. *Kommuner*; the secondary administrative divisions); North Greenland, one (excluding an unorganized territory); and West Greenland, fifteen. In other words, there were a total of 18 municipalities. Each municipality had a town as an administrative centre and included a number of settlements.

With this restructuring, Qaqortoq has strengthened a role as an administrative, economic, and educational centre. The town draws people, temporarily or permanently, from neighbouring towns and settlements. Despite the presence of a fish processing factory and the only tannery in Greenland (the government-owned, Great Greenland Ltd.), Qaqortoq is not considered a fishing/hunting town. Rather, Qaqortoq is a town of larger industries and bureaucracy.

Unbalanced distribution of population: towns and settlements

The skewed nature of population distribution is very clear between towns (84.5%) and settlements (14.6%), and this is the case in the population distribution between towns. The capital city Nuuk is the first (15,862 inhabitants); the ten largest towns account for over seventy percent of the total population as of 2011 (Statistics Greenland 2012). The populations of the rest of the towns and settlements vary between twelve hundred and a handful of people. Therefore, the majority of the population are disproportionately concentrated on limited parts of the huge island.

Everyday life and the cultivation of place

Community is formed and nurtured through a sense of belonging and solidarity, with which individuals feel at home in the space, real or virtual, in which they reside (Delanty 2010). The relationship between persons and the resulting association have been an essential theme of social sciences since the foundation of sociology by Tönnies (2001) and Durkheim (1997). The continuity of community in Greenland is marked by these kinship and friendship networks (Nuttall 1992).

While living in Qaqortoq, one of my Greenlandic acquaintances told me that a town in Greenland is to be made of families. Compared to knowledge gained through study, this remark really made the most sense to me after spending several months in town. By then, I noticed there were some dominant family names in the town, which stretch back to historic and authentic family lineages. This is the case in almost all the Greenlandic towns, and a person's place of origin can be identified through his or her family name.

Everyone walking down the street greets each other because they know each other and each other's kin relations. News of me and my wife's presence spread at "kamik" speed. Soon, I was busy greeting people when walking down the street, and I was under the illusion that I was famous in town. As the days of my return to Edmonton, a populous city with well over million people, approached, a Greenlandic friend said to me, "So, you will become anonymous again?" People very often visit their relatives' and friends' places with or without a previously scheduled appointment. Supermarkets and the local food market are places for information exchange and socializing. Although an unnecessary number of cars and taxis existed compared to the size of the town, traffic was not busy. Many children were playing on the street, and townspeople, young and elderly, came out to the street and the town square for chatting, greeting, or maybe just to pass the time.

As it was always like this, I felt that a line between public and private spheres of life may be less strict than busy urban areas of developed countries. At least, the distance between people seemed much closer than what I have experienced in today's Japan and Canada. (Psychological analysis on Greenlanders' cognitive processes towards the private sphere is beyond the scope of this research, and here I only provide a rather limited description of the phenomenon.) Therefore, Greenland communities' sizes are such that closeness backed by kinship and friendship relations are particularly important; providing the people with a reason to stay in the community.

Traditions coming and going

While not unique to town life, many Danish elements have entered into modern Greenlandic daily life. Greenlanders eat rye bread, many different types of cheese, and oatmeal in the morning. Greenlanders

greet by shaking hands, kissing, and hugging. Ceremonial functions are in a Christian style, such as *julemarked* (Dan. Christmas sale), funerals in a church, and parties associated with Lent. A new church on the middle of the hill in Qaqortoq holds mass regularly in addition to those held for Christmas, New Year's Day, National Day, and funerals. In Box 4-1, I describe the town's landscape as being interspersed with Danish cultural elements.

At the same time, we notice that some Greenlandic elements are not observable any more. I seldom heard stories related to the old beliefs such as the practices of *angakkoq* (Gl. shaman), before Greenlanders converted to Christianity. Never did I hear people mention their naming practices as described vividly by Nuttall based on his extensive work in north Greenland (1992, 2000).

In Greenland, a new-born baby is often named after a deceased friend or a deceased relative of the parents. For example, a new-born baby may refer to/address the wife of the deceased person of whom the baby was named after, as "my wife", and vice versa. According to Nuttall (1992:68, 2000), it is a foundation of community and underpins social relationships. I could not help but asking one of my Greenlandic friends if it is still so. He gave a wry smile and said that this was important only for old people. Yet, although the namesake person does not refer to/address people by the same kin terms as would be applied to the dead person, such as "my wife" and "my husband," he added that the naming practice still exists. Actually, he named his sons and daughter after his relatives and friends, hoping his sons and daughter would have the same skills and wisdom as them. Admittedly, understanding these relationships and practices is dependent on particular kinds of ethnographic experience. Presumably, this particular discrepancy is because Nuttall did his fieldwork in northern Greenland (the Upernavik area), where

traditional customs are well preserved as opposed to southern Greenland.

In addition, I did not see *mitaartut*, which is a Greenlandic custom where adults and children wear strange costumes to hide their identity while visiting one house after another (Nuttall 1992; Dahl 2000). Probably this would have been performed somewhere else, but I did not have a chance to see it.

In the end, some Greenlandic customs have passed away and some foreign customs have taken root. I view this situation as a new form of tradition being created rather than as Greenlandic tradition waning (see the end of Box 4-1 and the introduction of Chapter 8).

Establishment of towns and nation-building movement

During fieldwork, I often reflected on how Qaqortoq was reminiscent of our original homeland of Japan from twenty-five years back. My wife, also, often mentioned that the town brought back childhood memories of her hometown, a rural town in northern Japan. I felt that there was still something missing in a busy town: closeness with others and the ties with nature. However, for urban Greenlanders, human relationships and the ties to nature in a town are even weaker than in a settlement.

I have stated that a town is a place of intersection of traditions, but few people think this way. As Sørensen (2008) notes, a stereotypical image that Greenlanders have towards settlements and towns is that Greenlandic tradition was destroyed by modernization and was passing away from towns, while life in settlement epitomizes the essence of Greenlandic traditional values such as solidarity and human-environment.

Here, I briefly review the past and ongoing urbanization and

centralization that have created this dichotomic view. Greenland became a Danish colony in 1721, when an expedition was sent by the Danish–Norway personal union for mercantile and clerical purposes. During the Second World War, Denmark was invaded by Nazi Germany and lost its connection to Greenland between 1940 and 1945. When Denmark terminated its isolation policy towards Greenland in 1953, Greenland's colonial status was abolished.[11] Greenlanders were given Danish citizenship, and Greenland has remained a member of the Kingdom of Denmark ever since.

Modernization led by Danish initiatives in the 1950s and the 1960s and continuing until the beginning of the 1970s (commonly known as G50 and G60), caused push/pull factors between towns and settlements (Caulfield 1997; Nuttall 1994). Settlements judged as unprofitable by the authorities were closed down and populations were forcibly relocated from these abolished settlements to towns, such as Nuuk.[12] Fast-paced urbanization and centralization provoked a feeling of repulsion from Greenlanders towards the Danish-led modernization policy, inducing a sense of ethnic identity particularly among Greenlandic elites.

In 1979, Greenland was granted autonomous government by Denmark in the form of the Home Rule arrangement (see, Nuttall 1994). This was a new step forward for Greenland in terms of its relationship with Denmark. Greenland was the first Inuit populous country to gain an autonomous government. The move away from colonialism was in fact twenty years before the establishment of Nunavut.

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[11] One example of Danish isolation policy was that Danes who married Greenlanders were not allowed to return to Denmark.

[12] Citing Forchhammer (1997), Sørensen (2008) notes that modernization at this period was not exclusively led by Danes. A group of Greenlandic politicians and representatives were in favour of modernization at that time.

This process of decolonization, however, was not a result of the maturation of Greenland's own economy, the development of bureaucratic organizations, or the availability of human resources, but was accomplished through the Danish presence in Greenland that had lasted for more than two hundred and fifty years. For this reason, Greenland has struggled to increase revenues and to centralize its political system in order to reach a higher level of autonomy (Dahl 2000). This politico-economic situation pushed Greenland in the direction of the rationalization of the fishing industry and the concentration of the mining industry, which are profitable in the short term. The degree of centralization of politics and the economy is well reflected by the fact that the Greenlandic economy has been dominated by governmental institutions and government-controlled companies (Dahl 2000). Greenland's economy could be described as what Canadian economist Harold Innis termed a "staples economy."

According to this theory, Canada's economic development is driven by extraction and export of staples commodities (unprocessed and semi-processed raw materials), and the type of commodity upon which the region relies forms and shapes the trajectory of the region's political, social and cultural development (Innis 1995). In the case of Greenland, commodities for such a resource-based economy include seal, whale blubber and cod in the past; shrimps and minerals in the present; and perhaps oil and gas in the future. It seems that Greenland's tendency to rely on an economy based on the export of natural resources will continue for a while.

Greenlandic aspirations for greater autonomy were reinforced after 2009, when more control over domestic affairs, such as the court and police systems, was granted to the Self-Government (formerly known as Home Rule) on the condition that it could financially afford these domestic affairs. There are some quarters, for example

Greenlandic politicians, who believe that full independence from Denmark is within reach, if revenues from natural resource exploitation are reliable (see Nuttall 2008a, b). At the same time, there are some who warn against such an optimistic outlook for independence (Lynge 1998).

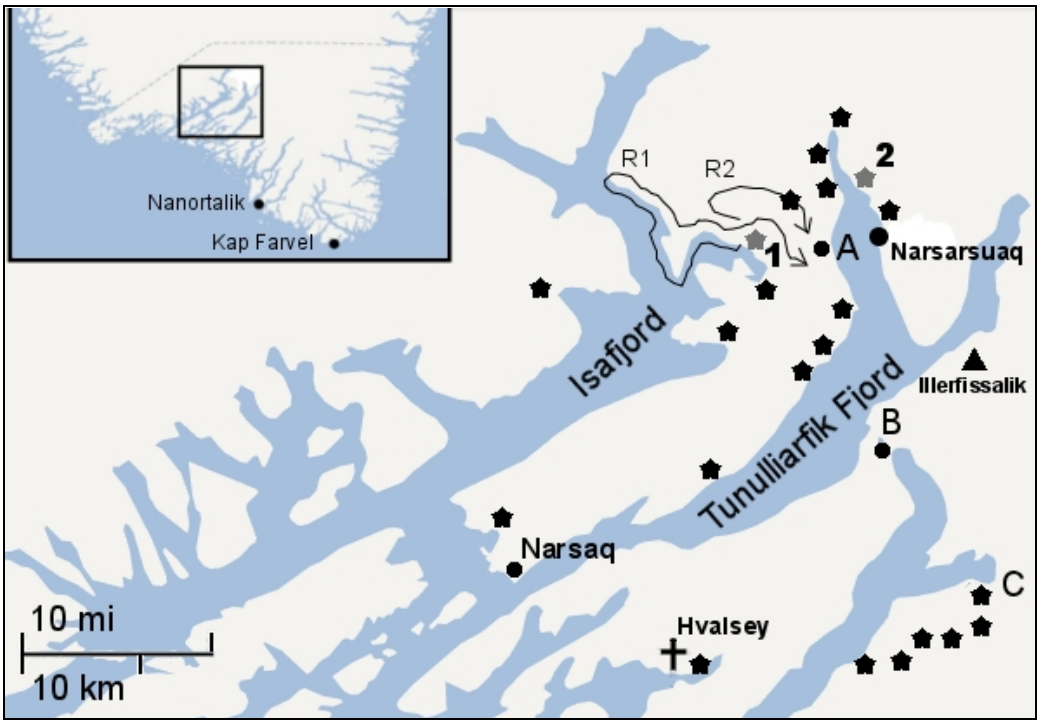
The stereotypic town–settlement image was created during this modernization process. A number of settlements decreased, and the administrative centralization continues to this day. The administrative restructuring in 2009 was part of this ongoing process. Under these circumstances, people in settlements still continue traditional practice such as subsistence hunting and communal activities. This is viewed by urban dwellers as settlement people reifying traditional Greenlandic values that have been lost in the course of rapid centralization and urbanization accompanying the still ongoing nation-building initiatives. On the other hand, town life tends to be associated with many social problems, such as alienation, loss of identity, culture erosion, and alcoholism; problems caused by rapid urbanization and social change. In the next section, I describe life in a sheep farming settlement to show how it contrasts to that of a town.

Life in a sheep farming settlement: Days in the round-up season

Just as scholars of Greenland have shown that hunting and associated traditional practices serve the continuation of coastal communities (Nuttall 1992; Caulfield 1997; Dahl 2000), I would like to argue that sheep farming does the same in uniting a community. I reiterate that my argument here belongs to the same category of the discussion concerning the matter of the population accounting for only 14.6

percent of the total population.

Life in a settlement viewed as ideal by urban dwellers is actually hard, sometimes lonely, and demands prudence and patience. To give a vivid picture, I will tell stories of my experience in the sheep farming settlement Qassiarsuk (Map 4-1). Qassiarsuk is a centre for sheep farming in southern Greenland and the place of origin of professional sheep farming on this land (as for the history, see Chapter 6). The settlement is separated from Narsarsuaq by Tunulliarfik Fjord.



Map 4-1 Sheep farms surrounding Tunulliarfik Fjord

A, Qassiarsuk (Brattahlid); B, Igaliku (Gardar); C, Igaliku kujalleq (Søndre Igaliku)
Each star represents a location of a sheep farm, while there are five sheep farms in each dot of Qassiarsuk and Igaliku. The shaded stars 1 and 2 represent Tasiusaq and Annannguit, respectively. A cross represents Hvalsey church (a Norse ruin). Round-up routes are shown in R1 and R2.

There are only five sheep farms within the settlement, but it is surrounded by many more. Over the hill is another sheep farm called Tasiusaq. I stayed at Tasiusaq for three weeks during September and October 2008 and participated in sheep farming with Kay, one of the farm owners.

My attempt is to portray the lives and livelihood of the people who actually dwell at a specific place. In order to convey a sense of settlement life, I provide a detailed description of farmers' practices, tasks, and chores that take place in landscapes marked by fjords and mountains; their skills and physical strength; and their vibrant harnessing of team effort. Images of bleating and scampering flocks of sheep in fjord landscapes in southern Greenland, farmers' life histories, a settlement's elementary school, housework, and organizational support from government are also illustrated below.

The reason for this descriptive section relates to my approach to anthropological research. I do not want to analyze people's lives from a symbolic aspect, but from that of everyday practices. This difference in approach towards community has already been argued in a circle of social sciences.

The 1980s saw "cultural turn," in which the emphasis placed upon the understanding of community shifted from social interaction based on locality to a culturally-defined unit of meaning. Since Cohen's (1985) theorization of *The Symbolic Construction of Community*, community was increasingly viewed as a symbolic structure rather than through social practice. This approach was criticized recently because excessive attention was placed on the symbolic dimension of community by undervaluing the social dimension of community shaped by social relations in lived space (Amit 2002). My approach follows this line of argument. Having spent time with sheep farmers for a year, I came to feel strongly that their

lives are shaped not by a symbolic structure of meaning, but by being nurtured through actual social relations, everyday farming tasks and chores, and their family ties. Therefore, unless I describe life rooted in a specific place, actual practice, skill, wisdom, or physical strength in living off on land, I could not properly analyze sheep farming in southern Greenland.

A sense of solidarity nurtured through occupation

Fall is the round-up season in southern Greenland. When I arrived in Qassiarsuk, the farmers had just started to gather their sheep from the hills and mountains. The day after I arrived, I joined the team, wandering around the fjord landscape with farmers. Even though separated by the hill, Tasiusaq is generally thought to belong to Qassiarsuk. During the round-up season, five farmers from three farms at Qassiarsuk, Kay and his father Pal from Tasiusaq, and two farmers from the valley north of Qassiarsuk work together. The surrounding mountains are not particularly high, but the ground is generally uneven, covered by shrubs such as creeping willows and dwarf birch, and the land includes varied geographical features such as gentle and steep rocky slopes, hummocks, irregular shorelines, screes, gorges, creeks, rocky outcrop, slabs, mossy bogs, and cliffs. Sheep meander in the vast territory that divides the fjords. It is not possible for one sheep farmer to gather his own animals, so sheep farmers in the settlement and neighbouring farms team up for the round-up season.

Round Up at Qassiarsuk in the morning

It was 12th October, 2008. Kay and I both slept in. We were

beginning to feel tired from the daily sheep round-ups that had preoccupied us for the past three weeks. Kay had long since developed blisters on his feet. Despite them, he had run across the top of a rocky hill at a blinding speed, driving sheep down to the shoreline the day before.

The barge *Usisoq* was coming to Qassiarsuk early in the morning to deliver sheep to a slaughterhouse in the town of Narsaq.[13] We had to join the Qassiarsuk team to herd the sheep down to the landing point, which was just behind the only grocery store KNI (*Kalaallit Niuerfiat*, GL; *Grønlands Handel*, DK; Greenland Trade) in the settlement. There was no time to take even a single bite of rye bread, and we climbed into a Toyota SUV.

The air was icy. It had snowed just three days before.

Kay is the silent type and does not usually wear emotional expressions on his face, yet I could tell by his hasty driving that he was feeling rushed. The Toyota rattled along the winding gravel road up to the hill.[14] The rumbling sound was a sign that the car engine had not yet warmed up.

The dark skyline ran along the top of the hill that marked the border between Tasiusaq and Qassiarsuk (Map 3-1). The families of Kay and his father, Pal, families live in Tasiusaq, which is situated at the west end of the land between the fjords. Qassiarsuk is situated at the east end.

Beyond the hill, the entire Qassiarsuk landscape spread below us, with Tunulliarfik Fjord in the background. I could make out the airport at Narsarsuaq across the fjord.

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[13] It is common to use "abattoir" among farmers in Canada. The reason why I use "slaughterhouse" here is that government officers and business people in Greenland I met used this word. Presumably this is because "slaughterhouse" is similar to the Danish word meaning it, *slagteri*.

[14] Kay called his vehicles by make, which is why I refer to them in that way here.

We arrived at Qassiarsuk at quarter past seven. All the farmers were still there but we were barely on time. Big Oskar was looking searchingly at the schedule that had been put up on the bulletin board of the grocery store. It showed the dates the barge was scheduled to go to various landing points in the southern Greenland fjords.[15]

Big Oskar was a bulky bear of a man, who never put on a diplomatic smile, which some felt made him look scary. In contrast, his slimmer brother, Facetious Franz, liked to joke and was a fast runner. When I used a Greenlandic word incorrectly, he would make seemingly endless fun of me. I never took it seriously because I learned this to be a Greenlandic way of mingling with people. He had approximately 800 sheep, which was – as far as I was aware – the largest number owned by any farmer in Qassiarsuk.

Jorck, who was probably the youngest among the independent farmers in Qassiarsuk, approached me and asked how many sheep we collected the day before this particular excursion. I replied, "About a hundred."

In the previous week, we had gone to the shoreline facing the northern fjord – the opposite edge of the Qassiarsuk farms – and drove a large flock of sheep from far back of Tasiusaq down to a pen at Qassiarsuk. It took us three days. Then, the day before, six people including Kay and I, went to bluffs along the same shoreline again and collect the remaining flocks of sheep. We kept the sheep in a pen situated on an isthmus between the bluff and Tasiusaq.

All the sheep driven down into the pen at Qassiarsuk were weighed and registered. Not all the sheep are sent to the slaughterhouse. According to age, size, and reproductive rate,

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[15] An adjective modifying a farmer's name in capital letters, such as "Big" in "Big Oskar," is part of his nickname as they say. An adjective in lower-case letters accompanying "the," such as "the hulking Haggi," means my subjective characterization.

farmers decide which should be kept and which sent to the slaughterhouse. From time to time, the farmers checked the sheep's teeth and the size of their pelvises, estimating their ages and selecting ewes that may produce good lambs for the next season. When selecting, even the farmers who always joke around are serious. After the weighing and selection, farmers release sheep to the fenced-in field.

That day's task was to round up the sheep, which had already been weighed, in the fenced-in field, herd them down to the landing point before the barge arrived, and load them onto the barge.

As soon as two pickup trucks started their engines, sheep dogs burst out barking in unison. Dogs in Greenland, whether they are sheep dogs or sled dogs, are extremely excited and anxious to run. I jumped on the load-carrying platform of the truck, and we started. All the dogs broke into a run. With their long tongues hanging out, they followed us at a furious speed.

Next to me was Ivar, a son of the hulking Haggi, crouching and holding on to the side of the platform. He was about ten years old and shy, but full of curiosity. He would always text me on my cellphone.

"*Qiiavit?* (Are you cold?)," he asked me.

"*Ijaar.* (Yeah.)," I replied.

The breath from the farmers' mouths was turning into white clouds. The pickups rumbled on a bumpy road, up to the southern side of the hill and pulled up just past the top of the hill.

Farmers were sneaking into the southern end of the fenced-in field to drive the sheep herds down to the northern end of the field, where a steep slope led to the landing point. It was the third time that I participated in this. The young Jorch was agile enough. Lightly putting his hand on the pole of the fence, he swiftly jumped over it.

The farmers spread to different ends of the range, as if it was predetermined who should take up which position. I followed behind the hulking Haggi who was plodding along the trail on the range. He broke into a trot. I was about to run to catch up with him, not knowing what was happening. He soon stopped, turning to me, and grinned.

"*Naaaa! He, he, hee...* (Fooled you! Ha ha ha...)".

Despite this episode, Haggi did not always fool around. A week earlier, when we were herding sheep down to the landing point in the same manner within the fenced-in field, he said to me, pointing to the air, "*Nigeq, nalinngiliik*? (Do you know "nigeq"?)".[16]

A gentle warm wind was blowing from the northeast on my face. I also thought I smelt grasses on the wind as well. He told me that when *nigeq* blew, it became a storm (*anorersuaq*).

As mentioned in the previous chapter, one of the characteristics of southern Greenland weather is the frequent change of wind direction. In most cases, a foehn wind is accompanied by cool temperatures. Accordingly, when a set of winds blow in the wintertime (i.e., *nigeq* with a foehn effect, causing a temperature rise followed by an immediate fall of the temperature), snow-broth will soon form thick ice layers that covers the ground. This is detrimental to the plants and the animals that graze on them.

As the hulking Haggi predicted, the weather worsened that afternoon. Before the high wind blew, I tied everything including wooden boards, cultivation tools and toys, in Kay's garden with ropes. For the next two days, we did not go out to the mountains for round-ups.

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[16] The word *nigeq* means a wind falling down from the interior ice sheet, often with a foehn effect (see Chapter on tree planting). Incidentally, farmers' remarks in the text are written in a southern dialect.

"Ho! Ho!"

"Phew, phew!"

Sheep farmers started to whistle and yell in high-pitched voices. Sheep stopped grazing and scurried away in the direction opposite to farmers, that is, to the fjord.

Sheep have a strong herd instinct. When one sheep begins heading for the seaside, the rest of the sheep follow. Yet, some wayward sheep will get out of flow, trotting off in different directions, but they cannot shake off swift-footed, jaunty teenager Iperaataq.

The sheep were surprised by Iperaataq, and darted back to the flock. The jaunty Iperaataq was a youngster from the brawny Carrson and untiring Fridolf's farm, situated at the middle of the valley running across the land north of Qassiarsuk and Tasiusaq. The Carrson and Fridolf brothers were also present. I ran after them as well, yelling to the sheep, mimicking the farmers. With a smile on his face, looking at me panting, Iperaataq said to me, "*Kiak!* (I'm warm!). *Naotaka, ajinngilatit?* (Naotaka, are you okay?)".

A number of small flocks intermingled, making long lines here and there and merging into larger flocks that finally trotted down from the hill to behind the landing point. Compared to round-ups outside the fences, herding within the fenced-in field was an easier job. As we came to this hill, there was a relaxed mood among the farmers.

"*Sunaana?* (What is this?)" Facetious Franz asked, pointing to a flock of sheep.

"*Savat!* (Sheep!)," I replied.

"*Godt!* ("Good!" in Danish)"

He sometimes tested me to see whether I really knew Greenlandic with obviously simple questions like this.

A wooden fence was installed around the landing point, confining the sheep. A woman, possibly a worker at the boarding house of an

elementary school stood behind it. She never went far beyond the Qassiarsuk farms, but I always seemed to see her there for round-ups. Since many women did not attend round-ups, my attention was drawn to her. Other than her, the women who took part in gathering sheep included Kay's wife, Aina; Kay's mother, Astrid; and Aqissia's wife, though she was outside of the Qassiarsuk round-up area. It seems that the women who take part in round-ups were keenly aware that their lives are closely tied to sheep farming. Usually, sheep farmers' wives are in charge of housework since farmers are working outside from morning until night (see Chapter 5). I often heard that it is very important for a farmer to have a good wife and it is not possible to engage in sheep farming without one. In effect, most sheep farmers had wives. Only a few did not, but in which case, they had their brothers and girlfriends as helpers.

Time still remained before the barge would arrive, so we decided to take a break, and each farmer went home. Kay and I dropped in at Facetious Franz's place for coffee. As is often the case with sheep farmers' settlements in Greenland, his house was a self-built bungalow. His wife and three children lived in this flat.

We took off our bibbed overall workwear and hung it up at the front door. I wore long underwear and a long-sleeved T-shirt under the pants and outer shirt. The house was warm inside, and Franz' wife was preparing for tea and coffee.

"*Suturusuppit? Tii? Kaffi?* (What would you like? Tea? Coffee?)"

"*Kaffisorusunneruvunga.* (I'd like coffee better.)," I said, with a Greenlandic phrase that I had just learned. Before my research in Greenland, I did enjoy coffee occasionally, but I picked up the habit of drinking several cups of coffee every day in Greenland. Someone in the town told me that coffee and tea were a kind of community drink, indispensable for socializing. In effect, there is a Greenlandic custom

called “kaffemik”, where on birthdays and similar occasions, the host’s house becomes an open house with coffee, tea, cakes, and sometimes a feast.

I noticed Hako was there. He lives at Upernaviarsuk, where he serves as an official animal husbandry adviser and a teacher for the sheep farming school, and is an active sheep farmer (cf., Map 7-1).

In order to become a sheep farmer, technically speaking, a certificate from the sheep farming school must be obtained. In effect, the jaunty Iperaataq and Franz’ son mild Malik were planning to go to Upernaviarsuk the following year. Upernaviarsuk is about forty minutes’ eastward sailing distance from Qaqortoq and is on the shoreline further back up the fjord. There is nothing but sheep farming facilities, and they are surrounded by hay fields, green houses, nurseries, and plantations (for plantation, see Chapter 8).

This property is called Upernaviarsuk Research Station, the objective of which is to carry out agricultural experiments and to promote sheep farming in Greenland. Students live together at the boarding house. The station manager, gardeners, and cooks live in townhouse-type bungalows. In other words, the inhabitants at Upernaviarsuk are people related to the Station only.

Hako arrived at Qassiarsuk the day before and stayed overnight at Franz’s place. It seemed that he was here to gather data on the quality of the flesh of farmers’ live sheep by scanning.

Before long, Franz’s cell phone rang, and he was informed the barge Usisoq was coming. Wrapping up the coffee break, we went outside. The barge anchored as closely as possible to the landing point, and the crew put down a wooden plank with rungs to serve as a gangway to the shoreline. Several farmers were putting up blue and orange tarpaulins at the back of the fence and pushing the sheep towards the barge. I held near to the middle of the tarp, sometimes

jostling it as the farmers did, to make a raspy rustling sound. The sheep feared the sight and the sound of these tarps. The sheep hurriedly leapt on the gangway, but some were afraid to approach it. A farmer took one sheep onto the deck, hiding behind the board fence installed there and showing the buttock of the sheep to lure other sheep. At the sight of the sheep on the barge, one sheep hopped onto the gangway, and several others followed. The farmers dispersed when all the sheep were on board.

I describe episodes that happened for the rest of the day in Box 4-2 at the back of this chapter. I portray one day of the round-up season from morning until evening. Through my stories, I hope that the readers can realize that farmers draw a sense of solidarity from common farming tasks and chores. I also intend to convey their determination to be farmers. My emphasis is placed on a relationship between farmers that is nurtured through their occupation, rather than on kinship although most of the farmers in this area are closely related.

After October: farmers' year-round work

Although the barge finishes its operations in the middle of October, the sheep farmers steadily continue to gather their animals well into November. Farmers generally keep their sheep in sheep sheds during the winter, occasionally letting them out briefly for exercise. Tupping (mating) occurs in December in the sheep sheds, with the lambing season beginning in May. Normally, sheep will have only one lamb, but if they are reproductively healthy enough, they may have twins. Sheep are kept for a couple of weeks until the lambs are bonded with their mothers and become accustomed to following them. After this,

all the sheep are released to the mountains and hills in the end of May.

Greenland's government requires farmers to keep their animals in the sheep sheds in the wintertime. Because of this, farmers must grow the grass for hay and produce hay bales in the summertime. The amount of fodder necessary to feed their animals during the winter is measured by fodder unit (Dan. *foderenheder*, FE). If their harvests do not reach the requirements, they have to purchase fodder from Denmark and other foreign countries to supplement the shortages. Farmers also purchase concentrates regardless of their harvests in order to enhance the nutritional value of fodder. A bad harvest inevitably bears a significant financial burden to farmers. Accordingly, summer weather conditions are a crucial factor to decide their "environmental" vulnerability to climate change (see Chapter 6).

What I realized at the school and the grocery store: Sheep farming and community viability

At times, I was invited to the settlement's elementary school to give talks about the climate and populations of Japan and Canada in comparison with Greenland, and I sometimes took part in the arts and crafts classes. The school is small. Three teachers taught only a dozen pupils at that time. They were also sheep farmers' wives, and one of them is Aina. All the pupils except for one were sheep farmers' children.

Sheep farming is something almost everyone is involved in, and many others who are doing other kinds of work have participated in sheep farming at some point in their lives. For example, the storekeeper of the grocery store had been a sheep farmer, and a woman who commuted from the neighbouring sheep farming area to work at a clinic was a sheep farmer's wife. Although individual sheep farms are widely dispersed on both sides of Tunulliarfik Fjord, it can be argued

that sheep farmers form one large community from a broad perspective even though there is still a complexity of closeness. Indeed, the area was established with a view to start sheep farming, as will be discussed in Chapters 6 and 7, and Qassiarsuk cannot be viable without sheep farming and the larger social and spatial farming environment.

I want to stress that it is their occupation, sheep farming, that makes Qassiarsuk and the neighbouring farms viable. Although I admit kinship has an important role in this, my emphasis is placed upon the occupational relationship.

Established teamwork

The smoothness of co-operative rounding-up, as I described at the beginning of this section, proves the fact that sheep farmers are bound through an occupational relationship.

When farmers round up sheep in a certain strip of land, they put people on key places to surround the area, not just driving sheep from one direction. Sheep will run away as people approach. As long as farmers occupy key places, sheep have little chance to escape from the round-up area. Farmers gradually decrease distances between them, pushing sheep in the direction they want to herd. Farmers disperse throughout hills and wide valleys. During rounding up, they radio each other (see also Box 4-3).

A round-up is hard work. Kay and others drive the animals while riding horses, but occasionally they need to dismount. When sheep flock to a slope that is too precarious for a horse to approach, Facetious Franz will sprint up the slope. As a regular winner at local running races, he finds this a piece of cake. I was always exhausted because I do not know how to ride and instead had to run up and down

the slopes. All that running made me think all the more about how some of them deal with this hard work.

At that time, Aina was pregnant with her third child. I was wondering how she would manage to run up the hills. When I asked her about this later that day, she burst into laughter and said that she could not possibly run up and down such a rocky slope with a baby in her belly. Her explanation was as follows. When farmers drive sheep, they are evenly spaced apart towards the travelling direction. For example, when they drive sheep on the slope horizontally, one person is at the bottom, one at the middle, and one at the top of the slope. When they drive sheep, the three are supposed to keep moving forward abreast. By so doing, each person can avoid moving more than needed.

This kind of good teamwork was evident at another round-up in the valley north of Qassiarsuk, where we drove sheep from the Tasiusaq side to the Qassiarsuk side (Route 2 in Map 4-1). The valley is not particularly deep but extends widely. I was told to position myself at the middle of the northern slope. Pal was at the bottom riding on his horse, and Facetious Franz was on the ridge. He moved widely on the plateau, riding on his horse, and driving sheep down to the descending slope. Big Oskar was riding in the middle of the southern slope of the valley. Giving instructions to each other by radio, we moved forward in a line against the travelling direction. Who gives instructions to whom depends on where they are. Rocky slopes are uneven, and sheep behind rocks cannot be seen from all directions. At times, I told Facetious Franz that sheep were hiding right under him and at other times, Big Oskar told me to drive sheep just behind the rocks in front of me. Farmers usually do not explain in detail their actions. They say something like “follow us and do it, and you can learn.” Like this, I gradually knew how they work

together.

Like the previous round-up, the distance to Qassiarsuk is too long to complete the job in one day. We wrapped it up at the middle of the valley, where the Carrson and Fridolf brothers' houses were located. Sheep were temporarily stabled in the brothers' sheep shed, in order to herd them down to Qassiarsuk the following day. When a round-up finishes halfway through the route, the nearest farmer's household is supposed to offer the participants lunch.

Lunchtime after a round-up is a cozy scene suggestive of a sense of unity nurtured through occupation. There are many subjects to talk about: a year's hay harvest, the building of a neighbour's new sheep sheds, someone's baby's birthday, a polar bear's appearance at such-and-such a place, and so on.

"*Qujanaq!* [Thank you]"

When someone gives thanks for a meal, regardless of who is the cook, people at the table all reply,

"*Illillu!* [You, too!]"

After a brief lunch, farmers return to their home farm, working on their own chores, and preparing for a round-up for the following day.

As I describe in Chapter 7, their strategies and procedures for round-up came from many years of trial and error of previous generations. Through long-term experience, the what, when, where, and how of their livelihoods was gradually determined. Solidarity is also passed on from one generation to the next. The next section discusses the self-reliance that is required from each sheep farmer and serves as a basis for a sense of solidarity.

Self-reliance needed for life on a farm

I have provided this rather lengthy description of the rounding-up of sheep in Qassiarsuk because I want to convey a lively sense of Greenlanders' sheep farming and a community united by sheep farming. I have described a cooperative activity involving people connected through the occupational relation and/or kin relations.[17] I have also described a gendered activity as round-ups are a man's task although some women like Aina participate in it (also see Box 4-4). Sheep farming requires not only collective work at specific times of the year, but also other kinds of work on a sheep farm such as tasks and chores needed to be carried out by individuals.

This section describes the spirit of independence necessary to live on a place far away from town. Farms are dispersed and isolated; and therefore, the viability of their livelihood is ultimately on farmers' shoulders. To better illustrate their isolation, I can use the way people refer to a sheep farming family. Except for Qassiarsuk, Igaliku, and a few other places, there is only one sheep farm (one family) at one place. Accordingly, the place name naturally indicates the sheep farmer's family. This reflects how sheep farms are sparsely located along the shorelines of the fjords. Namely, as will appear in Chapter 5, Qorlortukasik refers to Apollo's family, and Timerliit refers to Saqu's family. In the same way, Kay's family is referred to as Tasiusaq.

Also contributing to their isolation has been the lack of communication technologies. While fixed telephone and Internet service is now available (see the episode titled "In the evening" in Box

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[17] As I will illustrate in Chapter 6, most of the families in the Qassiarsuk area enjoy a kinship relation. Namely, they are descendants of founder Ottooraq Frederiksen. Yet, what I want to put the emphasis on in this chapter is social association nurtured by their occupation, sheep farming, rather than kin relations.

4-2; also see the episode "Aina's background" in Box 4-4), Aina felt severed from the outside world as she could not call parents and friends when she wanted. With these new technologies, Tasiusaq may not be as isolated as before. As communication and information technology has advanced, ways of socializing and networking has remarkably changed to such an extent that a virtual community has emerged (Delangy 2000). It is beyond the scope of this dissertation, but the role that technology takes in the making of community is open to future research.

Ardener (1987) argues that "remoteness" of place is perceived and imagined by outside people while the place is not actually as remote as the outsiders imagine from an insider's point of view. In my research, I want to stress that sheep farms are not symbolically constructed remote places, but are physically and psychologically isolated both from outsider's and insider's point of view. For this reason, in engaging in sheep farming, a farmer and his family's physical strength and mental stamina are always tested.

What is meant by living in an isolated place?

During the three weeks in Tasiusaq, I followed Kay wherever he went. I borrowed bibbed overall work wear and worker gloves. Kay was almost always outside during the day. I helped him with sheep herding and his farming chores. This gave me tremendous insight into the nature of the tasks of sheep farming.

Kay did all kinds of things, which were necessary for living in such a remote place, on his own. Since hay had already been harvested and there was still was a time before they confined sheep to the sheep shed, his tasks other than round up were focused on the maintenance of his equipment and property.

We set up stakes to make fences for horses and sheep and he trained his young horse. At times, he used a welding machine powered by a generator in a self-built shack. Putting on a welding mask and gloves, he looked like an experienced welder. With the machine, he fixed the broken metal ring of a halter and made a barbecue stand from some obsolete steel materials. He was particularly good at manoeuvering seven to eight tons of agricultural heavy equipment such as a New Holland backhoe loader and a tractor. Adeptly using the tooth of the front shovel bucket, he removed a flat tyre from the wheel of his Honda ATV and his Toyota SUV, which otherwise would not have been possible to remove by hand. To bury the cable lines extending from the satellite dish, He used the backhoe (as for the satellite dish, see the episode titled "In the evening" in Box 4-2).

Clearing a sheep shed required two tractors. The structure of sheep sheds in Greenland follow fairly fixed patterns. The floor was steel mesh and was elevated to a few meters high, which allows animal excreta to fall through and accumulate on the ground. Without heavy equipment, it would have been a very hard task to remove animal excreta from the ground level.

A tractor was also required to put the boat down in the water and pull it out onto the shore. Boats were kept on the shore when not in use, so as to avoid damage from sea ice. It looked difficult to attach the boat to a boat trailer in the water, but Aina skillfully navigated the outboard right above the trailer. Kay pulled the trailer from the water at once.

Every time I was at a scene of this kind, I was impressed by their proficient skills in equipment. At the same time, I could not help but think how difficult it would have been to live in this isolated place without heavy equipment. In order to maintain such a scale of

farming as Kay's, heavy equipment was indispensable. To put it the other way around, heavy equipment made it possible to enlarge the farm to today's scale.

Some basic clothing, electronics, and construction equipment were available at the grocery store at Qassiarsuk, but when more specific items were needed, it was necessary to sail to the towns of Narsaq and Qaqortoq, which would require two hours and four hours sailing by outboard, respectively. It was tough to sail the fjords with biting wind in the face. Moreover, icebergs are calved constantly at the head of Isafjord, which make water transportation difficult and dangerous during the summer (Map 4-1). The inlet of Tasiusaq iced over as early as the middle of October. In the evening before we went shopping to Narsaq, Kay and I had to cruise around the inlet in piercing cold in order to break the ice.

There are no electricians, carpenters, plumbers, or welders in the settlement. Sheep farmers are required to take on this kind of work. Accordingly, they build their housings and sheep sheds on their own. This is a usual practice in small hunting communities throughout Greenland as well. The government financially supports self-builders to a large extent for the costs in building materials such as cement and wooden boards. This also applies to the building of sheep sheds.

It took Kay and Aina two years to build their home. Before starting, Kay received instructions on how to work on self-building. Kay laid the foundation and the framework of the house, and Aina worked on the interior. When travelling around sheep farms, I actually saw partly-built sheep sheds on farms at a couple of places. They dig in the ground with the backhoe to make footing on which they build column formworks with steel bars. They pour cement concrete into the formworks to make pillars. Then, they are going to build walls and the roof. In this way, they spend a couple of years to build

their sheep sheds.

Farmers have to secure life line by themselves. In order to get water, they have to lay out water pipelines to lead water from the nearest river. Aina would pull over at the middle of the hill on her drive home from Qassiarsuk in order to fill a bottle of water from a small spring. The spring water tasted good, and she would use it for drinking and cooking.

Farmers use generators to make electricity. The previous generator accidentally caught fire four years ago. During my stay in Tasiusaq, Kay often checked on the seemingly-complicated generator's system. Around the generator's shack, there were many used and unused steel oil drums. The excessive use of electricity wasted oil, so the generator was often off late at night. As things continued in this vein, there was a time when warm water turned cold when I was taking a shower. But, it could not be helped. I thought they were on the better side of things, while living in such an isolated place. At that time, Kay was considering building a small hydro electric generator at the creek. In effect, two sheep farmers in Vatnahverfi, as I write in Chapter 7, built a hydroelectric generator, and as a result, the use of oil was reduced to almost nothing. This story was what had inspired Kay.

Self-reliance as a basis for a sense of solidarity

In order for farmers to live in isolated places on their own, it is necessary to do everything they need to survive and to keep their business going. They also need to be capable to manage danger lurking in their environment. Farmers sometimes help each other when they have a hard time, but basically they are required to be independent. A sense of solidarity as I have described above is formed

between these independent, capable, and self-sufficient farmers. That is, without self-reliance, trust, respect for each other, and shared values nurtured through sheep farming, a sense of solidarity could not have been established (cf. Ingold 2000:69-70).

Concluding remarks: a relationship nurtured by an arduous occupation

In comparison with town life, I have described life in a settlement. When it comes to life in a settlement, what concerns me is a political movement in favour of a higher level of independence that has gathered momentum. In Greenland, nationalism tends to take the form of reaction or repulsion to Denmark and the presence of Danes in their territorial entity (Gad 2009). Nationalism is a political ideology to invoke awareness towards a nation's territorial integrity, and to lay out the idea of the establishment/ revival of an autonomous community within a given boundary. To forge a "community," nationalism needs to give expression to feelings of unity, intimacy, and commonality towards the population within a given domain (Delanty 2010:150-151). However, the "community" that a nationalism movement forges in order to raise territorial awareness is a sense of community without substance because it is created ideologically, not based on face-to-face communication within a given boundary. Anderson (1983) uses "imagined community" to refer to this and is exactly the case in Greenlandic nationalism.

As I have described above, an actual community, i.e., a settlement, is bound by a sense of solidarity, and this solidarity has been cultivated through direct communication and direct networks based on occupational relations and kinship relations. For urban Greenlanders, life in a settlement epitomizes Greenlandic traditions

such as collectivity, solidarity, communal society, ecological way of life, hunting, and close relationship to nature (Sørensen 2008).

On the contrary, nationalism that politicians and government have forged has been causing alienation, materialism, health problems, detachment from nature, and reduction of the number of settlements in pursuit of the name of economic rationalization and administrative centralization. The settlements that remain are politically and economically in obscurity under the current government policy.

The maintenance or creation of Greenlandic traditions, in the shadows of modernization, is a serious problem for Greenlanders. If settlements really have cultural meaning to Greenlanders, analysis of life in settlements will offer food for thought to Greenlanders who try to open a vista for the future in the course of the nation-building movement. This is why I wanted to describe life in a settlement and the lives of the people who make a living there.

Sheep farmers who appear in the latter part of this chapter are closely related by kin relations; a point that tends to be stressed in the existing literature concerning coastal hunting communities (Nuttall 1992; Caulfield 1997; Dahl 2000). I would rather emphasize that it is the sheep farming occupation that plays a crucial role in nourishing this community's human relationships. In other words, the community could not be viable without sheep.

Sheep farming is an arduous occupation requiring farmers to be industrious, hard-working, ingenious, and independent. It is because they are independent, self-reliant, and economically self-sufficient that they produce excellent teamwork when working together, as we have seen in their round-ups. Self-reliance is an indispensable resource for individuals to hold a creative view of the future. This relates to the discussion on the creation of a tradition as "endogenous development" in Chapters 6 (on a history of sheep farming) and 8 (on tree-planting).

Although sheep farming is an arduous occupation, sheep farmers want to continue to be farmers, and some youngsters want to settle in uninhabited places to become sheep farmers. As I have stated in the beginning, Qassiarsuk and Igaliku are different from the rest of sheep farms because they form a settlement. Other sheep farms disperse in the fjord landscape.

Why do these youths want to become sheep farmers, especially in such isolated places? How do they try to open a vista for the future? These questions will be thoroughly answered in the following chapters.

I analyze Greenlanders' frame of reference towards time and space, which can be understood through the landscapes on which they dwell in Chapter 5 (on Norse ruins); the history of the development of modern sheep farming in Greenland and the creation of a tradition through sheep farming in Chapter 6; and the lives of sheep farmers who live in isolated places in Chapter 7.

Box 4-1 The townscape of Qaqortoq

Here, I would like to describe the townscape of Qaqortoq to give a sense of a modern Greenlandic town. I hope that the following rather lengthy description of a townscape gives a stark contrast to that of life in an isolated place in terms of material endowment and the population density, which will be discussed in the next section. Also, I try to show the readers that the townscape is a mixture of elements of Greenlandic tradition and vestiges of Danish colonization.

Buildings and geographic features

Let's hit the streets in Qaqortoq.

The town begins at a cove and extends along a rugged slope up to the top of a hill. The roads themselves wind back and forth up the hill, with stairs for pedestrians connecting the roads throughout. Colourful houses, painted in red, yellow, and blue, flank the winding roads, and it appears as though one is looking up a rocky amphitheatre.

The other side of the hill is rather natural, with no paved roads. At the north end of the town, there is a large lake, eight kilometres in circumference, named Tasersuaq (Gl. "big lake" in the literal sense).

Not far from the bank, a rock sticks out of the water, and is called *allagarsuaq*. The town founder, Norwegian merchant Anders Olsen (pronounced like "a-nes uulsen") carved his name on this rock in 1777. The lake freezes in the winter, and I was able to see his carving by cross-country skiing to it.

A creek runs out of the lake, flows through the middle of the town, and feeds into the sea. By the mouth of the creek stands a

small local food market (Gl. *kalaalimineerniarfik*), where licenced fishers and hunters are allowed to sell their catch and produce.

Over the bridge from the local food market, there is a town square with a stone fountain that has three-little-dolphin ornaments on it. It was built in the 1930s, when cod fishing was a booming economy for the town.

A shop behind the town square is a former smithy built in 1871, and the building of the existing museum was built in 1831 for the then-Colony-Manager's residence (Schultz-Lorentzen and Vadstrup 1993).

There are many shops and stores. The town has three large supermarkets. One is an outlet of a Danish private company, called Brugsen, with a logo slightly modified from the original Danish logo signify the Greenlandic flag. The others are two stores of Pisiffik, which was previously owned by KNI (Gl. Kalaallit Niuerfiat) and is now privatized.[18] Other than that, one can find a furniture store, an electric appliance shop, a stationery shop, an optician's shop, clothing stores, restaurants and the like. A tourist office was previously community-owned, but has since been privatized.

The town has an incinerator with a large chimney, a fire station, a dockyard and a heliport. The town is physically expanding, and several houses and apartment buildings were under construction near the top of the hill.

A close look at the townscape shows that the town owes much allegiance to Greenlandic traditions and Danish influences. I have tried to illustrate that a rich volume of footprints of human activities in the past are clear in the townscape even in the course of the ongoing developmental process.

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[18] KNI is a successor of the Royal Greenland Trade Department (Dan. Den Kongelige Grønlandske Handel, hereafter KGH.

People whom I met

As long as I was in town, I tried to go outside walking around the town, at least, once a day. Otherwise, I was prone to confine myself to home all day, organizing data. When walking down the street, into a super market and the tourist office, I would bump into people I knew. Sometimes, a new idea for research was inspired by conversations with them.

One of the places I haunted was the local food market facing the inlet. I made a habit of checking fish and meat that hunters and fishers sold in the barracks. As I became acquainted with them, some of them came to speak to me at the sight of me, telling me about their catches and interesting stories like an appearance of a polar bear nearby. Old people were also present at the local food market for chatting. Sometimes, retired sheep farmers visited the town to sell their dried cod and herbs.

Since my wife worked as a cleaner at a nursing home, I had opportunities to meet several elderly relatives of sheep farmers' families at the nursing home.

There were seldom youths at the local market, but I met many youngsters at high schools. The number of youngsters was relatively high because the town draws many pupils and students from various parts of Greenland. Qaqortoq plays host to a grammar school (similar to a high school in Canada) and a business high school. Graduates from these high schools can further their education at the University of Greenland (Gl. *Ilisimatusarfik*) or at a Danish university. In addition, there are a technical/vocational school, a worker's school, a primary cum lower secondary school, an elementary school, and five daycare centres. Particularly, I often visited the business school on the seaside hill, even though I did not have any specific appointment.

Numerous times I chatted with students, which provided me with many opportunities to learn about their thoughts on education, business prospects, and much more about Greenland. Some students even surprised me by showing Japanese animation video clips that they had downloaded online.

Chatting with Danish teachers was also insightful. They gave me several opportunities to give guest talks at the grammar school and the business high school. Most of the teachers at the elementary school were Greenlandic, but technical posts, such as high school teachers, and administrative posts, such as town planning, were partly occupied by Danes.

At the back of the business high school lies the Agricultural Advisory Office. Needless to say, I visited this office numerous times, and occasionally I saw sheep farmers who visited the town for meetings. At the graveyard that extends to the back of the Advisory Office, people who made their home here are buried.

Events

Seasonal events that may be prevalent throughout Greenland are well described by Dahl (2000:43-50). Here I only address some striking events I encountered during my stay.

One of the festive events in town is the annual National Day' ceremony on June 21. The ceremony had performances by the choir, which consisted of men in white anorak and women in anorak with colourful beads. The choir plays a vital role in festive occasions in Greenland and is indispensable. For example, the town choir travels from house to house on Christmas, singing in the garden or by the front door, while the host house provides them with shots of alcohol or dishes.

During the summer of 2008, approximately thirty cruise ships called at the town; double the number from the previous year. They were from Scandinavian countries, the United Kingdom, Europe, and Canada. Some cruise ships carried more than one thousand tourists, and when they arrived, the number of people in the town swelled out to one and a half times the normal population. Some of the town's people played Greenlandic folk songs on guitars in the street, while others tried to sell their handmade items and produce they had picked or grown. This was done at stalls, which were provided on special occasions by the seaside tourist office. Their products included photos of the sea, animals, and ice floes; stones and ore; stone carvings; herbal tea bags; and handmade crafts. These tourists were also able to enjoy a Greenlandic style coffee party, called *kaffemik*, at a local's house.

Local hunters and fisher demonstrated how to cut whale and seal meat at the fish market and tourists took walks along the lakeside with local guides. Students from the business school worked as guides or as clerks at the souvenir shop of the tourist office.

Yet, the town's wharf was too small to live up to its name *kongensbro* (Dan. the King's bridge) resulting in cruise ships being unable to set anchor. After their sightseeing, over one thousand people had to stand in a line for small barges to take them back to the cruise ship.

A rock concert of English star Bonnie Tyler was held on a stormy evening in February 2009. It was an extremely exiting event on long winter's night. Actually it was surprising that this famous rock singer accepted a request of a man who runs a bar in this tiny town. His bar, situated in the middle of the town's hill, was too small to hold a concert. In effect, the concert drew hundreds of people, even from isolated sheep farms. The concert took place at a gym beside the big lake, which is the usual venue for festive public events, such as the

banquets of the National Day and of the annual sheep farmers' general assembly (as for annual sheep farmers' general assembly, see Aina's episode in Box 4-4).

Concerning festive events, it is very common in Greenland to use fireworks. For example, on New Year's Eve, they set off fireworks four different times. This reflects townsmen's kin networks extending to foreign countries. They set off fireworks at eight o'clock, reflective of midnight in Denmark; at nine, midnight in the Faeroe Islands; and at ten, Iceland's midnight. Then, when the clock strikes midnight, almost all the households and people in town go on a firework spree, such that the entire sky turns red, gold, and green at lower altitudes.

By means of the description of the townscape, I wished to address the mixed nature of Greenlandic culture. There is no use in viewing Greenlandic tradition being undermined. Greenlandicness still remains in the depth of their everyday life, and perhaps, we are seeing a process of a tradition being created or shifting to a new state (cf. Sahlins 2002).

Box 4-2 One Day in the round up season

Afternoon: in the fenced-in field in Tasiusaq

When we returned to Tasiusaq, Kay's wife Aina teased us because she knew that we rushed out early in the morning, having to skip breakfast. We ended up with a late breakfast.

Breakfast in this part of Greenland usually consists of rye and wheat bread, several kinds of cheeses, and cereal. During my stay at Tasiusaq, I learned to cook *qorlortitat* (oatmeal), which I had never had in Japan. Another habit I picked up in Greenland was putting sliced cheese on a piece of bread and spreading berry jam on it, which proved to be tastier than I had imagined.

I made an interesting observation about Greenlandic meals in founder Ottooraq Frederiksen's house, which is still preserved in the settlement and now used for the exhibition of old pictures, apparatuses, and the furniture used in those days. There are some pictures that show a scene of the family sitting at the dining table from some sixty years ago. The meal scene shown in the pictures did not look so different from that of today. I imagine a scene of this kind has been reproduced for a century.

After our late breakfast, we started to round up sheep within the fenced-in field. When Kay started a Honda all-terrain vehicle (ATV), the sound of the engine startled sheep nearby and they started to scoot away. While Kay drove the Honda towards a flock of sheep, I was in the back of the vehicle, yelling to sheep in a high voice. Some which were sleeping on the pasture and did not notice us until we got closer leaped up and bolted down the pasture.

As Kay steered up the hill of the fenced-in field from the west end along the fence, sheep scrambled down the hill. Kay's sheep dog was

driving sheep as well. Kay dropped me off at a higher elevation, and as directed, I prevented sheep from approaching the hill. Standing on the footrest, Kay was skillfully manoeuvring the Honda on the irregular terrain. Several flocks were scurrying down the hill, and a white swarm was gradually getting bigger. In just a short time, he drove over a hundred sheep to the side of the creek at the bottom of the hill.

He further pushed them to the other side of the creek, where the pen was situated. As I walked down to the pen, the mild Malik and jaunty Iperaataq drove a pick-up truck from Qassiarsuk. When they saw me, Malik asked me, "*Aina sumiippa?* (Where is Aina?)". When I replied she was at Pal's place, they drove down the road that penetrated the fenced-in field. Pal's house was at the other side of the creek as well.

At this side of the creek, I helped Kay to drive sheep across it. Aama, the 6-year-old second son, was gambolling around, yelling at the sheep. In contrast, Ani, the 7-year old first son, was riding on a horse with a calm expression. He sometimes behaved like this to show he was the elder brother. Sheep farmers' children learn to ride on horses and ATVs in their childhoods and become familiar with sheep and sheep raising.

There is jargon used among sheep farmers to differentiate between various sheep and it shows the uniqueness of their viewpoint of sheep. At the pen, Malik and Iperaataq were carefully watching scuffling sheep inside the fence, sometimes pointing at specific sheep, and repeating the word *angutikulooq* (pronounced like "a-gu-chi-ku-law"). The Greenlandic word *angutikulooq* literally means "a big man," but used here, it means sheep over one year old; that is, a ram, in this case. Similarly, a male lamb is called *angutikulooraq* (a little, big guy). In the same way, a ewe over one year old is called

arnavissaq (a female of animals), and a female lamb, *arnaviaaraq* (a baby girl). Old sheep are called *Utoqqaaq* (the elderly).

Incidentally, if a farmer says he has 400 sheep, what is meant by his remark is he has 400 ewes. It is known that one ram can mate seventy ewes at most. Accordingly, in most cases, farmers keep only two to three rams to 100 ewes. In other words, the number of ewes is more important than that of rams.

Farmers make every effort to have twins from a ewe. I heard ewes around five years old were of the best fertility. The ewes that become less reproductive, for example, those between eight and ten years old, are likely to be removed to the slaughterhouse.

Each sheep has an ear tag attached. Some sheep farmers keep a record of their sheep's genealogy and weights. In this way, farmers maintain the desired age distribution of their flocks through selective selling and reproduction.

In the evening

Malik and Iperaataq loaded five sheep on the pick-up bed and drove them to Hako in Qassiarsuk to check up on the meat quality. Later on, Kay would head for Qassiarsuk as well to be present at the scene of the checkup.

While Kay was away, I helped set up Aina's laptop with an Internet connection. The Internet had created excitement both in Tasiusaq and the middle of the valley north of Qassiarsuk. These two areas are outside the cell phone range of coverage. If it was necessary to make a call, they had to go over to the Qassiarsuk side of the hill.

Fixed telephone services were not available in these areas either. When Aina wanted to call her parents in northern Greenland, she had to get assistance from an operator at a VHF radio station. They were

forced to put up with the inconvenience, which made them feel even more isolated. Then, a week before, the great news saying the fixed phone services, including the Internet connection, would soon become available reached the farmers.

The pieces of the required satellite dish were sent to Qassiarsuk beforehand. On a stormy day a week before, Kay brought them over to Tasiusaq with the Toyota. The day after, technicians from Tele Greenland flew over by helicopter and built it up in their backyard. Yet, there must have been some problem with the reception. The technicians flew back to the farm the following day for further work.

The pilot decided to show off. Once flying away towards the inlet of Tasiusaq, he circled around with the skyline of the mountains behind them. Approaching us at a lower elevation, he sharply soared up to the sky just in front of us and disappeared behind the hill of Qassiarsuk. We romped to this aerial show.

When I finally got her computer hooked up to the Internet, Aina was so delighted, I felt like I did a great job for her. Before long, Fridolf called Tasiusaq from the middle of the valley. He was excited as well, saying, "Hilarious! I can make a phone call, while sitting at the desk in my house!"

As stated earlier, a great deal of housework is left to a sheep farmer's wife. Aina was a farmer's wife, a mother of two boys, and a licenced teacher at the elementary school. At the time of my visit, she was expecting another baby, but she was still taking on all these roles.

Aina always tried to cook a supper with various dishes, such as mashed potato, *ruuat* (turnips), lamb meat, boiled *kigutilik* (also called *qeeraq* in western Greenland; the Atlantic wolffish [*Anarhichas lupus*]), and steamed rice. Potatoes and turnips were grown in Kay's kitchen garden (see Chapter 5). Boiled *kigutilik* is a common diet in southern Greenland. The flesh is bland-tasting but oily enough to

give a feeling of fullness. On another occasion, I was served a curry soup with *kigutilik* at another sheep farmer's place in a southern fjord. Since I was working on round-ups and other chores for Kay, I was already hungry by supper time.

The most memorable Greenlandic cuisines for me were the whale meat dishes. Aina once served us pasta with minced meat of *tikaagullik* (mink whale), and I was served hamburger steaks made of the minced mink-whale meat at another sheep farmer's place. When I was a child, wheal meat was commonly available in Japan, and I used to have it as smoked meat.

There was a time when Aina boiled chunks of seal meat that Kay shot at the inlet of Tasiusaq on his way home when he went shopping to Qaqortoq. I had acquired a taste for seal meat by then, and the strong fishy smell was rather welcoming to me.

Sometimes, she baked rolls after supper. Unlike in the towns, there was no bakery in the settlement, though frozen bread was always available at the grocery store of Qassiarsuk. Among other things, *ifiaq qaqortoq* (white bread, as opposed to rye bread) was one of Aama's favourites.

After supper, there were times when Kay's family invited Pal and Astrid for tea and coffee, and vice versa. It was a time for three generations to get together at a sheep farm in Tasiusaq. They seldom stayed late, as a round-up awaited them the next day early in the morning.

Box 4-3 Another round-up activity

On 5th of October, 2008, farmers met at the shore of the Tasiusaq inlet (Route 1 in Map 4-1). The meeting time was seven in the morning, as usual. Fridolf, Jorck, Aina, Aina's second son, Aama, and Astrid were present. Pal was already busy preparing his outboard. I saw Big Oskar through the window before I left Kay's house, but neither Kay nor Big Oskar were on the boat.

We were going to get sheep from the northernmost round-up area towards the head of the fjord and to drive them back. Pal started the Yamaha outboard motor and sailed off to the north along the shoreline. On our way, he dropped off people at various points. Aina got off at the first open place. Astrid and Aama got off at the second open place after a broad bluff. I realized later on by looking at a map that the first and the second open places were both edges of an isthmus. Finally, after passing a long shoreline, where gentle rocky slopes, covered by bushes and grass, fell down to the water; Pal left Fridolf, Jorch and me on a shingle beach. Pal continued to sail off to the north along the sharply curved shoreline and he soon disappeared behind the rocky slope.

Jorch and Fridolf walked up the slope to the ridge. Jorch headed over the ridge and was soon out of sight. The untiring Fridolf seemed to walk along the ridge heading north. Before going, Fridolf had told me to go and search for sheep towards the north, on the rocky slopes extending down to the sea. Yet, it seemed I did not understand what I was supposed to do. I did not see any sign of the animals on the rocky slopes, but spotted Pal's boat far away. I waited on the hill for a while, but it did not seem that he was returning any time soon. I began to feel uneasy, not knowing what I should have done. I called Fridolf with my radio.

"*Fridolf, naalaarpit?* [Fridolf, do you read me?]"

There was no answer. I looked out over the wide sweep of the fjord one more time. All the strong sunshine made the cobalt blue sea more vivid, forming a stark contrast to the dotting drift ice. An uncanny silence forced me to realize I was alone in the icy air. Then, I saw a flock of sheep in a direction towards Tasiusaq, and I was totally at loss as to whether I was to stay or chase them. Knowing Fridolf and Jorch would be driving sheep from the ridge, I decided to wait for them. Then again, I ended up walking towards Tasiusaq and driving the sheep in that direction. I figured I could not miss the sheep. I moved very slowly, paying attention to the back.

When a good two hours had passed, I suddenly noticed a small flock of sheep running towards me from far back. When I saw the young Jorch walking the upper part of the slope, I felt relieved, knowing I was no longer alone. He motioned me to drive them down to the shore. I did it. Before long, the untiring Fridolf caught up with me. He said with a grin that he lost his radio somewhere on the slope. Pal sailed back and pulled in to the shore near us. We put the sheep on board and then got into the boat.

On our way back, we saw Kay on a horse chasing a flock of sheep up to a shingle beach. Having their escape route cut off, some of the sheep jumped into the water and started to swim off shore. We approached them and pulled them up onto the boat. Then, we caught the rest of the sheep on the beach and dragged them too onto the boat. Kay rode the horse further down. It was almost two in the afternoon when we finally arrived at the isthmus.

The farmers let the sheep ashore. Honestly speaking, until I noticed a pen being there, I was left to wonder why the farmers released the sheep they caught after all their hard work. I finally realized that they were trying to drive sheep into this pen. Big Oskar

and the hulking Haggi were on their horses beside the pen. I saw Astrid walking up from afar. Aama was gambolling around Aina. When Aama saw us on the boat, he ran up to us.

"*Ittu!* [Grandpa!]"

Pal beamed at his grandson.

The round-up area between the northernmost point and Tasiusaq is too wide to work on in one day. Farmers built the pen halfway beforehand to confine the animals temporarily. Usually farmers wrap up a round-up in half a day probably in order to avoid excessive exhaustion. The day following, we herded the sheep to a pen in Tasiusaq and on the third day, we further herded them down to Qassiarsuk.

In the case of this particular day, I should have waited at the original place until Jorch and Fridolf drove sheep down to the shore. Pal's role was to give direction with his radio to farmers from the sea if there were sheep at a spot that were difficult for the farmers on the slope to see. My task was to check sheep from diverting and to drive the sheep towards the isthmus, where Aina and Astrid were standing to check them from moving towards the northeast. Big Oskar and Haggi were on their horses at the back of the pen, keeping the sheep staying in front of the pen. Then, when all the sheep arrived in front of the pen, they pushed the sheep into the pen all at once. I asked Aina why the farmers did not put sheep into the pen by order of arrival. Aina said it was easier to put them in all at once.

Box 4-4 Self-reliance necessary for being a farmer

Kay's background:

Kay is a great grandson of founder Ottooraq Frederiksen, and, to some extent, he was expected to become a sheep farmer from his youth. After finishing the 7th grade at the settlement's elementary school, pupils are required to move on to the latter part of three years' primary education at the public school (folkeskole) in Narsaq. Having finished compulsory education, he moved to Upernaviarsuk to attend the sheep farming school. Practicum in a foreign country is part of the educational programme of the sheep farming school. Most of the students choose Norway or Iceland. The Upernaviarsuk Research Station to which the sheep farming school is affiliated and the Agricultural Advisory Office at Qaqortoq have long-standing research and practical relationships to research institutes and farmers in Nordic countries.

Kay went to Norway for the first time at the age of 19. Having spent the first six months studying at a seaside village in northern Norway, he moved to a mountain village to carry out his practicum. He once showed me pictures of round-ups in lush Norwegian mountains in those days. As I had a hard time driving nimble sheep on the rocky hills in Qassiarsuk, I wondered how they could gather sheep in such a mountain with a thick forest. Kay laughed and replied to me that Norwegian sheep were easily caught because they did not run as fast as Greenlandic sheep. As I describe in Chapter 4, most of the Greenlandic sheep are of Icelandic origin.

After graduating from the Upernaviarsuk farming school, he returned to Norway and continued to study Norwegian and worked on a sheep farm. After all this, his stay in Norway amounted to five

years in total. Then, he became an independent sheep farmer at Tasiusaq at the age of 25. Although Kay was young, his professional career had reached nine years when I visited Tasiusaq.

Aina's background

On the other hand, his wife Aina was raised by a Greenlandic father and a Danish mother in a large town of northern Greenland. She grew up as an urban girl.

Kay and Aina met at an annual party held by the Federation of Sheep Farmers' Associations (Savaatillit Peqatigiit Suleqatigiissut, henceforth SPS). As the name indicates, the SPS is the united body of local sheep farmers' associations. Apart from the association of the Qassiarsuk area, there are associations from the Igaliku area, the Vatnahverfi (southern Igaliku) area, and the Tasermiut area. In the beginning of July, the SPS holds a general assembly, together with the Agricultural Advisory Office at either Narsaq or Qaqortoq, with the location of the meeting alternating on an annual basis. The first day is spent on the annual report from the Agricultural Advisory Office, an advertisement presentation by an agricultural equipment manufacturer, and enlightening presentations by firefighters, bankers, telephone company officers, power plant officers and so forth. The second day is a general assembly of the SPS, opening with a choir.

In the 2009 general assembly, a couple of important items discussed were the impact of drought, fodder prices, and the viability of wool production. Wool production was carried out only on a small scale because of the high transportation fees that ensued from scouring and manufacturing.

After two days of meetings, various forms of Saturday entertainment take place, such as a long-distance race, soccer games,

attractions for children, and a bazaar in which sheep farmers' wives sell handcrafts, herbal tea and jams. The series of events wraps up with a huge banquet in the evening, which celebrates their profession and draws in sheep farmers' families, friends and the town's people. The number of the participants will often reach three hundred or more. This is the moment for sheep farmers to reaffirm the beauty of sheep farming, their sense of unity, and to identify with their colleagues who usually live apart.

An awards ceremony also takes place, honouring sheep farmers who have demonstrated excellence in hay production and other farming activities. A sheep farming school convocation is held during this ceremony.

The party incorporates sheep farmers' songs between the other items on the agenda, and everyone sings in chorus, while an elderly sheep farmer plays the accordion. When a musical band starts to play on stage, people dance in the middle of the hall. This is likely the only opportunity for farmers, who live so remotely, to indulge in such a celebration. This may also provide good courting opportunities for youngsters, and this is how Aina got acquainted with Kay at the age of 15.

Aina's mother wished her daughter to receive a higher education before her marriage. After finishing primary education at the age 16, she had an opportunity to study in southern Alaska for the whole year.

In Greenland, it is not uncommon for Greenlandic youngsters to study abroad. Some make use of AFS Intercultural Programs (formerly the American Field Service) like Aina did in order to study abroad. Some choose to study in Denmark with government support. Many youngsters have Danish parents and relatives, and their kin relations may make it easier to decide to receive foreign education. I speculate the percentage of people who get to study abroad is high in

Greenland. Among them, I met a man, who studied at a high school in Japan when he was a teenager. He made use of AFS. He surprised me by speaking to me in Japanese.

Returning to Greenland, Aina studied at a high school type of school in Aasiaat and Qaqortoq for three years to pursue secondary education. Then, she married into Tasiusaq's family. Her education eventually paid off because she was able to obtain admission to Ilinniarfissuaq (the Teacher's College of Greenland) in Nuuk. In a small settlement, such as one with a population of fewer than fifty, a person from the community can be hired as a *timelærer* (Dan. temporary teacher in Danish), but Aina wanted to become a formal teacher. In so doing, she thought it would be better for her own children's education. Accordingly, she commuted over the hill to the school every day with her children using the Toyota.

Another sheep farm north of Tasiusaq separated by the fjord

There was a sheep farm at the other side of the fjord. This farm shows the typical isolated nature of the landscape compared to a settlement. The owners were famous as potato growers as well and produced 47 tonnes in 2007. I visited the farm twice during my fieldwork.

The farm was run by two brothers. The view of only the family's house and barns beside an inlet filled with drift ice brought home to me how isolated the farm was. Their extensive potato fields were covered by broad white plastic foils to prevent frost damage. Water was led through pipelines from a river nearby, and they were spraying water with a large sprinkler when I visited.

Like in Tasiusaq, telephone services were only available through an operator-assisted marine VHF radio. (However, they got a satellite

dish at about the same time as Tasiusaq.) The two brothers were using radios to communicate with each other and with home while working outside. This is how broad their land was.

At that time, their potato harvester machinery was out of order. As a result, they were digging out potato fields by hand with hired helpers. In parallel, they were making a new field beside the inlet. Greenland's soil is full of stones. I once asked an old sheep farmer elsewhere why farm students at Upernaviarsuk were not going to Denmark for their practicum. He snorted and replied with derision that it was useless going to such a stone-free country! Although the land can be dug up by heavy equipment, such as bulldozers, man power is eventually needed. When I saw them removing stones by hand from the entire field, it seemed to me that it was staggeringly hard work.

5. Living with History: Interactions Between Norse Ruins, Fjord Landscapes, and Time

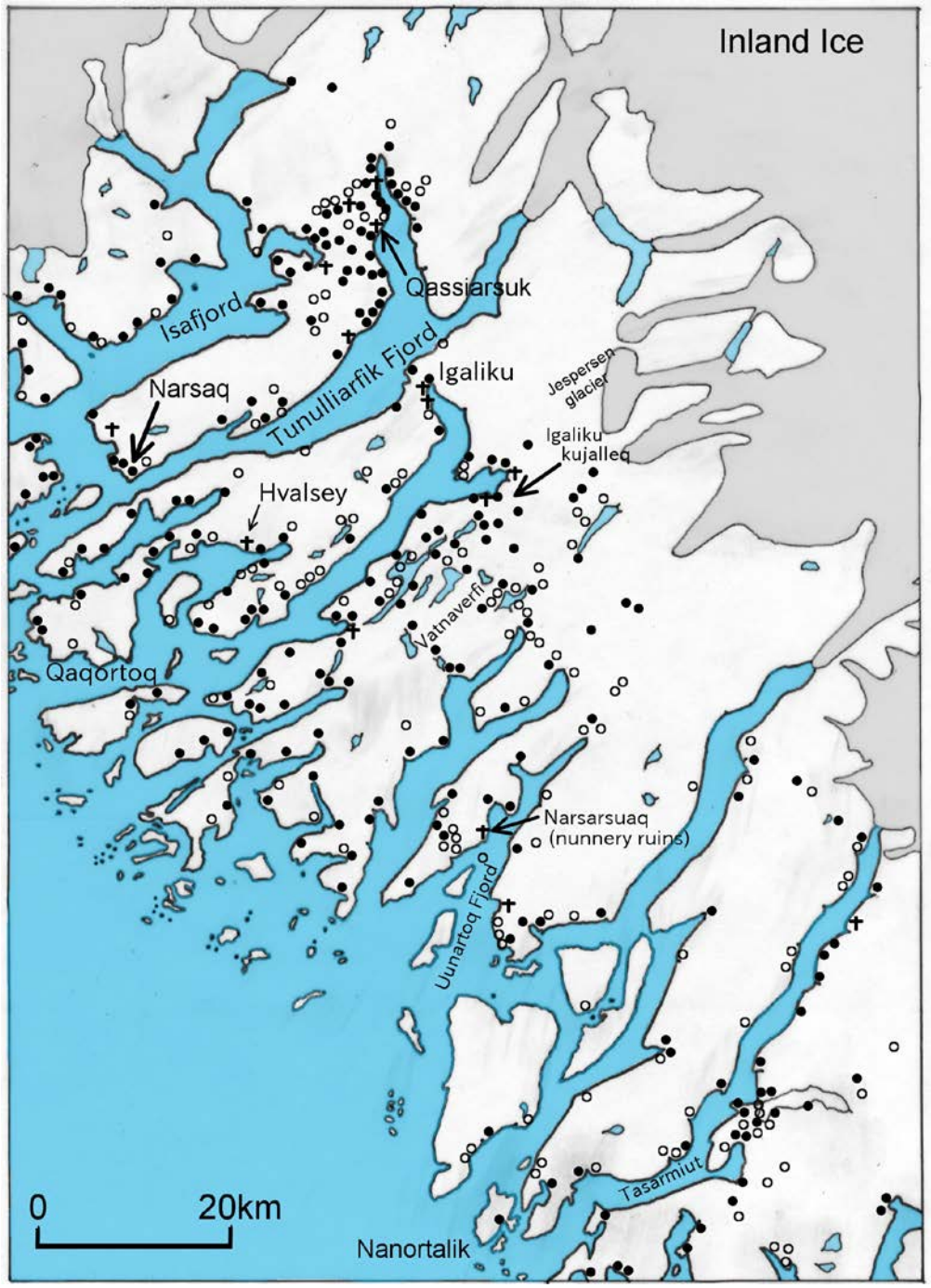
Introduction:

This chapter discusses a perspective towards the past that locals can gain from their landscapes in southern Greenland. Norse settlers (Vikings) and Danish colonialists made their home in Greenland in the past and in this sense, many seemingly ahistorical and wild landscapes in Greenland are actually historical. Examining landscapes from this viewpoint is very important because we can learn how today's Greenlanders understand the current and future states with reference to the past. Using a viewpoint of cultural landscape, which is increasingly used in the fields of anthropology and human geography, I would like to discuss this matter.

It seems that there are two types of landscape studies concerning human–environment relationships: one focuses on the materialistic and/or physiognomic aspect of the landscape, while the other seeks a system of symbolic meanings in the landscape. For example, Austad and Hauge (2008) illustrate a pastoral landscape of Sognefjord, southern Norway, as a complex variety of vegetational patches which were transformed by years of intensive resource-use systems, such as grazing by domesticated sheep and goats, tree-coppicing and pollarding, and the seasonal rotation of land use. They conclude that human footprints have been imprinted upon the landscape over years. Another research line is to scrutinize the naming system of the landscape which people inhabit. Moving through the environment on an everyday basis for their livelihood, inhabitants give social and

cultural meaning to specific geographic features of the landscape by naming, thereby increasing their attachment to it (Basso 1996).

Ingold (2000) dismisses both approaches to these landscape studies on the ground that the former views human activities too neutral, perhaps only as an ecological agent in the environment, and that the latter places too much value on the creation of an explanation, or interpretation, of symbolic meanings in the landscape. He proposes a perpetual process of mutual activity between humans and the environment, on which they dwell together in the landscape. Ingold (2000:190) calls this constellation of inter-activity the "taskscape." He argues that the features of the landscape are the temporal intersects of the relationship of everything in the landscape. He also argues that if focused on human activity, the features are temporal forms of people's relationship to their surroundings generated by their dwelling on, moving through, and engaging in the landscape. Accordingly, discovering the meanings in the landscape will require the understanding of life cycles, or rhythmic patterns of both animate beings and inanimate objects. Just as the people in question dwell in, are engaged in, and have an interrelationship with the environment, observers (i.e., anthropologist or archaeologist) also need a perspective of attending, dwelling in, and moving through the landscape in order to understand the human-environment relationship.



Map 5-1 Norse ruins in the Eastern Settlement (Østerbygden)

Black circles represent localities of Norse farms, while white circles indicate remains of Norse dwellings (including stables and pens). Crosses show church ruins. (Source: *Map of Eastern Settlement* published by Tage Schjøtt in 1990)

Following this, I argue for the need to be aware of the life cycles of people with the passage of time and the interaction of the past culture with the present. The past is so close to the present in Greenland. Numerous Norse ruins are scattered around sheep farms along the fjords (Map 5-1). Walking around and living in the "taskscape" is a reminder of how people lived several hundred years ago. Today, the lives of Greenlandic sheep farmers are superimposed on the sites of these ancient dwellings, just as motion pictures are over-layered on one screen. Therefore, the understanding of today's farm landscape and lives built on it entails a historical perspective towards them. To put it another way, situating oneself in, and working in a farm landscape with relics from the Norse and the colonial eras, farmers can develop a historical relation to the past in the present. This chapter explores these themes while reviewing the first half of a history of sheep farming from the Norse period until the 19th century.

A landscape of Narsaq: the dynamics of human activity from antiquity

On a sunny morning in July 2008, I stood on the shoulder of the twin peaks of the mountain, just as Henrik Lund wrote in his hymn in 1910.

Putsut tamaani issortitersut	A thick blanket of fog here and there
qaqqarsuarmit kaanngartitersut	Moving away from the mountain.
qatsungavissoq	A dead calm
allalivissoq	A clearing sky
Narsaq qulaannit ammut isigaara	I am looking down at Narsaq from above.
Taava imanna taallamik oqaatigaara.	Then, this is how I tell with a poem.

(The hymn for the town of Narsaq, written by Henrik Lund, with my translation)

I was looking down at the town of Narsaq, a small town in south Greenland with a population of 1,598 as of January 2011 (Statistics Greenland 2012). Lund was a half-Greenlandic, half-Danish priest, poet, painter, and provincial council member. In composing his words, Lund pictured an imaginary scenery of Jerusalem and perhaps, glorified the landscape of Narsaq in his hymn. When cruising into the Tunulliarfik (Eriks Fjord) from the outer sea, heading to this town, the range of mountains rising up from the shorelines is conspicuous. Narsaq narrowly spreads along the shorelines, just under the head of the mountainous range. The word *narsaq* is a Greenlandic word for "the flat", but the flat space actually accounts for a tiny fraction of the land. Buildings and houses speckled a tiny fraction of these plains.[19]

When I was in Qaqortoq, during the evenings of early summer, May and June, I often saw fog (Gl. *pujorsarneq*) slowly approaching from the sea to the town. When it moved through the town, it was slowly climbing up the slopes of the mountains, and then pouring down to the big lake behind the mountains. When I happened to see a picture dated June 6, 1924, which shows exactly the same scenery as seen today, with frosty mist drifting down to the big lake, I could not help but think that the same phenomenon must have been repeated since time immemorial. Like this, the passage of time and people's feelings and sentiments about the landscape can be understood with reference to literature, pictures, and individual movements around these landscapes.

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[19] Greenlandic place naming system is, in most cases, descriptive of a characteristic topographic features of the area, and in some cases, conveys a story that pertains to the place (Nuttall 1992). This is very different from European systems, such as English-speaker's ways, in which places, in many cases, are named after the person'. Yet, such a naming system is not peculiar only to Greenlanders. For example, Japanese place names convey their geographic features, history, and stories. If it was a Japanese way of thinking, Narsaq would be named *qaqqap ataa* (underneath the mountain), which is my speculation.

Catholic priest Finn Lynge, who was born in Nuuk and now lives in Narsaq, told me that one of the reasons he decided to live in Narsaq is because the locality and surrounding environment along the peninsula and in the fjords has a humanitarian significance in the history of humankind. In order to understand what he meant by this and to convey the significance of his account, I briefly review a history of human migration in Greenland.

As Krogh (1967, 1982) states, a history of Greenland includes histories of, at least, six independent peoples, who migrated to Greenland at various intervals and disappeared from history. All the five peoples are different Inuit groups who migrated across the Nares Strait/Smith Sound region, the so-called gateway to Greenland, which connects the Canadian Arctic and northwestern Greenland, while one group sailed over the Atlantic Ocean from Iceland. Today's Inuit Greenlanders who inhabit the vast spread of the island are the descendants of the seventh immigrant group. Between 2500 B.C.E. and 200 C.E., four groups of Palaeo-Eskimo cultures flourished for several hundred years before disappearing. It is generally thought that Greenland was uninhabited from 200 C.E. to around 800 C.E., when finally another Palaeo-Eskimo people, the Late Dorset Culture, may have come from Canada and stayed only in the northwestern part of the island.[20]

At the end of the 10th Century C.E., when the Late Dorset

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[20] The Palaeo -Eskimo culture peoples can be divided into two groups in terms of the geographical extent (Meldgaard 2001:319). In the lower part of the island, extending from Melville Bay of western Greenland, over Kap Farvel, to the northern Ammassalik area of eastern Greenland; the Saqqaq Culture flourished during 2500 – 800 B.C.E. The Early Dorset culture took over the same area from 700 B.C.E. and lasted until around 200 C.E. On the other hand, the northwestern and northeastern parts of the island, as far as to Peary Land, were occupied by two peoples, whose cultures were split into two phases with an interval of several centuries. Namely, the Independence I culture lasted during 2400 – 1300 B.C.E., overlapping the Saqqaq Culture in the south., Then, the Independence II Culture during 800 – 0 B.C.E., coincided with the era of the Early Dorset Culture in the lower part of the island.

artistic traditions were at their zenith in the north (Odess et al. 2000:194), Icelandic farmers settled (Icelandic, *landnám*) in the southern part of the island, bringing their stock animals with them. Coincidentally, when the Norse sailed out westward, there was another group started to expand eastward from their original place of northern Alaska – The Thule People. With highly developed tools and techniques, this Neo-Eskimo people reached northern Greenland and settled presumably around 1200 (Schledermann 2000:198). It remains unclear whether the Late Dorset and the Early Thule peoples co-existed in northwestern Greenland during 1200-1300 (Gulløv 2000:323-324). Either way, the Thule people's southward movement continued.

Having hunting grounds around the greater Disko Bay region, the Norse settlers encountered the Dorset and Thule peoples presumably by the 13th Century. During this time, the Late Dorset culture gradually vanished. The prosperity of Norse farming culture also began to decline, and totally disappeared by the middle of 15th century.

On the other hand, the Thule people continued their expansion along the eastern coastline and reached to the present Ittoqqortoormiit region by 1500. They finally dominated all the coastlines of Greenland, except the northern most and northeastern parts. Having survived the so-called "Little Ice Age," modern Inuit had contact with Europeans, mainly Danes, in the early 18th Century. The mixed heritage between Inuit and European began to flourish, which is the basis of today's Kalaallit culture. Therefore, the history of Greenland is made up of these waves of immigration and decline of several peoples.

Priest Lynge's previously mentioned remark refers to the encounter of the Norse and Thule people in the vicinity of Narsaq

around the 13th Century. If we adopt the "Out of Africa" theory (the population replacement hypothesis in the debate on the evolution of anatomically pre-modern to modern humans), humankind expanded eastward from Africa some 125,000 years B.P., walking across the Bering Strait, moving through the Canadian Arctic, and finally encircling the globe to encounter another people in western-southern Greenland (cf., Feder and Park 2001). Perhaps there might have been some fights between them, but archaeological surveys carried out nearby Narsaq indicate that they cohabited in a peaceful manner (e.g., Vebæk 1993).

Lynge embraces and articulates the generosity, peaceful character traits and ingenuity of humankind in this history.[21] I was impressed by his story, knowing that his affection was derived not only from his personal experiences and connections to the landscape but also from a deep sense of archaeological and historical time. Presumably, there may be more Greenlanders from the educated class, who share this kind of view of connecting the current state to the past. Lynge gains a sense of a long history of human activity from the landscape of Narsaq and appreciates the mutuality of overlapping human cultures from the past to the present.

The past and the present in Nordic landscapes

Returning to the landscape viewed from the shoulder of the twin-peak mountain of Narsaq, I move on to elaborate on the history of sheep farming in the Norse period.

From the mountain of Narsaq, I took photographs of the town. When I look at them now, I reflect on how they contain stony slopes covered by grasses and dwarf bushes, winding shorelines, land seen

[21] Lynge has also discussed this in a published essay (Lynge 2008).

faraway over the fjord, numerous ice floes and several small islands on the dark blue sea, as well as wharfs, harbours, and houses in red, blue, and yellow.

Later on, some of my friends told me that these photographs are redolent of a harbour in Newfoundland, while others associated them with Norwegian fjords or an idyllic village landscape somewhere in another Scandinavian country. Although I have not been to any Nordic country except for Denmark, nor to Newfoundland, I know that shorelines deeply cut by fjords; a long, narrow inlet; bluffs sharply rising from the sea; small islands and ice floes on dark blue water; and sheep grazing on the seemingly barren land are indispensable scenic elements to Nordic life.

Vikings/Norse settlers may have contributed to the making of commonalities in the landscapes of Nordic countries. They continually colonized those countries with similar geographical features. Starting from Norway, they migrated to Shetland, to Orkney, to Ireland, to Scotland, to the Faeroe Islands, to Iceland, to Greenland, and finally to the Labrador, Canada, during the period between the late 8th and 11th Centuries.[22] Contrary to a general vandalic image, their life was based on stock farming with seasonal or occasional fishing and hunting (Ólafsson 2000). However, they were traditionally skilled in carpentry, shipbuilding, and sailing and would carry out sporadic plundering and seaborne migration. As is often the case with immigration, settlers tried to maintain the same way of life in their new land as they had followed in their place of origin. These

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[22] The term Viking was applied to Nordic peoples by the British. A group of "Norsemen," in terms of adversaries to southerners, made a raid upon Lindisfarne (Holy Island) in 793 C.E., the date of which is generally thought as the beginning of the Viking Age. After that, they frequently despoiled British coasts. The term Viking is the curse of the north by Britons referring to them as marauders, but Nordic people who stayed home were never called Vikings. Settlers of Greenland presumably never identified themselves as Vikings, but as farmers (Fitzhugh 2000:14).

Norse brought sheep, goats, and cows along with them to their new world where they became farmers and traders. This shows that Inuit Greenlanders were not actually the first people to engage in sheep farming in Greenland.

With Nordic climatic and edaphic conditions, animal husbandry combined with small-scale farming would have been the best way to utilize the land. In effect, sheep farming became a common occupation in these Norse countries. In this way, Norse settlers pursued the same way of life in different countries with similar landscapes.

The people have kept strong ties with the land through their subsistence. Their relationship to the land can be found in their farming traditions and the form of their dwellings. Although the origin of word Faeroe is thought to be "sheep" (Dan. får), Thorsteinsson (2008) argues that the origins of Faeroese land use practices should be sought in Norwegian farming traditions. Church ruins with turf walls have a common structure among the Faeroe Islands, Iceland, and Greenland (Krogh 1967, 1982).

I have already argued that the past is very close to the present in Greenland. This observation is also true for Iceland and the Faeroe Islands. In these Nordic countries, generally speaking, the land is sparsely populated and there are not many buildings blocking one's view. The wide visibility derived from this fact brings one a strong sensation of being situated in a particular space and of travelling back in time. At the same time, this consistent visibility makes one feel that historic and/or monumental topographic features, which often have legends, are physically close to them. In Iceland, for example, the places include both artificial and natural ones, such as pens to round up sheep, paths and cairns on the land, and ice floes, waterfalls, and harbours. By actually moving through the same places as the

Norse, today's Icelanders can realize that they share the same space as the past people that settled the land. This realization gives the Icelanders the sensation that they are Icelandic; connected to the ancient settlers, transcending a thousand years. Its authenticity comes from the landscape, its constituents – animate and inanimate – and a sense of being situated in the landscape where their pioneers carved out their lives (cf., Hastrup 2008). The feeling of the closeness to the past is also found in the Faeroe Islands. When Gaffin was visiting one of the villages on the islands during his fieldwork, locals told him a story from the Middle Ages as if it happened only recently as they pointed to the scene of the story nearby (1996:17). Similar interactions also happen in Greenland.

Norse farms and ruins in southern Greenland

Let us continue to explore the theme, in which dwellers' lives from the Norse period to the present overlap to provide the present-day dwellers with a frame of reference concerning time and space.

The Norse settled in Greenland in the late 10th Century and established two colonies in Greenland: one is the Eastern Settlement (Østerbygden) in south Greenland, while the other is the Western Settlement (Vesterbygden) in west Greenland.[23] Norse Greenland did not develop in isolation of the mainland Scandinavian countries. They exported walrus tusks, and in return, imported wood for buildings, bronze for church bells, and iron to make farming and

[23] The Eastern settlement ranged from Kap Farvel to Tigssalukfjord (north of Ivittut), the area of which roughly falls on the jurisdiction of today's towns of Narsaq, Qaqortoq, and Nanortalik. The Western Settlement was 6-700 kilometres northwest of it, where today's Nuuk lies, ranging from Buksefjorden in the south to the northern side of Godhåbsfjorden in the north. This area was convenient to the Norse to go hunting to Nordsetur (the greater Disko Bay area, which provided a walrus hunting ground for Norse).

hunting equipment. Trading was a proof of the connection to mainland Scandinavia.[24] Presumably, Norse Greenlanders identified themselves as a part of mainland Scandinavia (Diamond 2005: Ch. 6). This tendency was increased, particularly after the conversion to Christianity. As its farming society thrived, based on animal husbandry, the Eastern Settlement was incorporated into the control of the Archbishop in Nidaros (today's Trondheim, Norway), and ultimately the Pope in Rome. Like this, while they built a society well-adapted to the new land, Norse Greenland was politically and economically incorporated into the Scandinavian system.

By the late 13th Century, the population size of both the Western and the Eastern Settlements was more than 2,000; however, they disappeared without a trace (Lynnerup 2000:294). It is considered that the Western Settlement vanished by the middle of the 14th Century, and the Eastern Settlement, by the middle of the 15th Century. There are a number of hypotheses for the demise of Norse settlements: conflicts with Inuit Greenlanders (called *Skrælings* by Norsemen); raids by English pirates; admixture with the Inuit; the spread of epidemics; famine; degeneration; climate change; and migration to Norway or America (Krogh 1967:119; Lynnerup 2000). Yet, the reason why Norse society vanished from history is still shrouded in mystery.

Taking from numerous Norse ruins, I describe the landscapes of three sites in the following: Hvalsey (Qaqortukulooq); Brattahlid (Qassiarsuk); and Gardar (Igaliku). By discussing these three sites, I explore the interactions between ruins, landscapes, and time.

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[24] The hood found from the church ruin at Herjolfsnes, across today's Frederiksdal, has a long streamer, or a liripipe, at its backside hanging down on the back. This type of clothing was popular in Europe during the Middle Ages, though this rather short hood would not have served as windbreaker in the Arctic cold environment (Arneborg 2000:315). Through trading, Norse Greenlanders tried to keep pace with the contemporary European styles.

Hvalsey church (Qaqortukulooq): a magnate in the Norse farming society

During the Norse period, a number of farms were established along the fjords of south Greenland. Churches were built beside farms. This indicated that churches played an important role in the development of the Norse farming society in Greenland (Arneborg 2000:314-315). East of Qaqortoq, just at an hour cruising distance, there is a place called Qaqortukulooq (Dan. Hvalsø, Eng. Hvalsey), where the largest Norse church ruin is situated.

Initially, the Christian churches in Norse Greenland were private churches, which means churches were not independent entities. Leading farmers or chiefs loaned the land to churches and built the church buildings (Arneborg 2000:314-315; Diamond 2005:192). The owner of Hvalsey church was entitled to a share of tithes collected by the church from its large parish. This indicates that the owner must have been a magnate, enjoying a special status in the ecclesiastical system.

The place name *Qaqortukulooq* means "being big and white".[25] The suffix "*-kulooq*" means "big," or "very much" in a southern Greenlandic dialect. Today, this church ruin looks as though it were made of bare stones, but it is speculated that it was painted white when it was built around the 12th Century. When Inuit Greenlanders saw this church ruin from the sea in their kayaks, it must have stood out clearly against the green Norse farm, with a backdrop of the brown, rocky mountain *Qaqortukuluup qaqqaa*.

It seems that, at first, the Inuit Greenlanders wanted to settle in

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[25] The Danish name Hvalsø means "whale lake", yet there are different explanations about the origin of this place name.

this place, but they must have ultimately found it unsuitable. Presumably, a place which was good for Norsemen farmers was not suitable for Inuit hunters. They built their settlement just west of this place, where the town of Qaqortoq now lies, instead. They called the town, simply, "Qaqortoq," the name of which means "whiteness," or "being white." Southern Greenlanders tend to drop the latter part of a word, just to make it shorter, but this is speculation on my part. It is unknown why they named this town Qaqortoq.[26] However, this episode illustrates the contact between the Norse and Inuit after the 14th Century.

One of the reasons why the Eastern Settlement is speculated to have vanished in the middle of the 15th Century is that there is no written record about the Eastern Settlement's affairs after 1408. The last written record about the Eastern Settlement is an entry in Icelandic annals, which were kept by clerics in Iceland. According to it, Thorstein Olafsson and Sigrid Bjornsdottir were married at Hvalsey Church September 1408.[27]

The Hvalsey church was built on a farmstead. Narrow, rectangular stone ruins by the church are the remnants of sheep and goat sheds and/or cattle byres. At the end of the building complex lies a small room with stone shelves on the walls. It is speculated that the Norse magnate entertained his guests while sitting down on the shelves.

Sailing the fjords in southern Greenland, one can find green patches on the slopes of the shoreline, which are likely remnants of old Norse pastures. Today, Greenlandic sheep farms lie exactly on the

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[26] Some say that the town name comes from the colour of granite produced around this area.

[27] Presumably the groom Thorstein was an Icelander, while the bride Sigrid seems to have been a Norse Greenlander (Berglund 1982:10). They took back to Iceland a certificate that proved the wedding was performed in accordance with proper Christian procedures (Arneborg 2000:316).

same spots. In effect, there are a few Greenlandic sheep farms around the Hvalsey church ruin. An image I have is several films of farmers' lives at the same spot from different eras all played at once, overlapping each other. It is interesting to note that a thousand years after the Norse settlement, places around Qaqortukulooq are, again, a centre of sheep farming.[28]

Thjodhild's church at Brattahlid (Qassiarsuk): a scene of the repetition of livelihood

Unlike its end, the beginning of Norse society is well known. According to the Greenlanders' Saga (Is. *Grænlendinga Saga*), 15 years before Christianity was established by law in Iceland, a man called Erik the Red, led Norse people to colonize southern Greenland, setting sail from the northwestern coast of Iceland. Since it was the year of 1000 when the Christian faith became law in Iceland, it may have been the summer of 985 or 986 when Erik and his followers left their country for good. Among 25 ships, which must have been heavily loaded with around eight hundred would-be settlers (Arneborg and Seaver 2000; Schledermann 2000) as well as sheep, horses, cows and goats, only 14 ships succeeded in arriving at south Greenland. Some were forced back and some perished. The Book of the Settlements (Is. *Landnámabók*) tells how the inner fjords of southern Greenland were divided among the settlers. Erik decided to make his home in Brattahlid (today's Qassiarsuk) at Eriks Fjord.

Although there were some Christians among the first settlers, the majority of them were heathen. However, Erik the Red's son Leif

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[28] Indeed, the government of Greenland applied to have the Hvalsey church and the surrounding area designated as a UNESCO world heritage site with a name of something like "Agriculture one thousand years".

and especially his wife, Thjodhlid, deeply embraced Christianity. She threatened her husband with not sleeping with him if he did not get baptized. Erik begrudgingly built a church at a distance that ensured it barely entered his field of vision. This church, commonly called Thjodhlid's church, is the first Christian church in the New World. Apart from Erik's reluctance to convert to Christianity, the Norse settlements were Christianized by 1015 through the efforts of missionaries. Thjodhlid's church was a small rectangular building, only 2 metres by 3.5 metres, but it was speculated to play a central role for the settlement's political and social affairs. Namely, it was an assembly-place and a space for Christians while the churchyard and surrounding lands were where the dead were buried. The increase of the population necessitated the rebuilding of it several times.

From the rich amount of archaeological work, we can speculate on the life of Norse Greenlanders between the 11th and 15th Centuries (Krogh 1967, 1982). Excavated ruins included dwelling houses and outbuildings such as byres, sheep sheds and hay barns, folds, dikes, and dams, while artifacts included clothes, utensils, tools, bones of animals, parts of ships, and children's toys. These findings reveal that Norse farmsteads were situated on grassy slopes and plains facing the inner fjords.

During the summer, animals were allowed to graze on the hillsides, outside of the hay pasture, what is called a fenced-in field today. Farmers would have been kept busy preparing winter fodder. They grew hay grasses on the manured field fenced with turf-clad, stone-made dikes that kept animals away. Even in southern Greenland, they could possibly grow grains such as rye. However, with longer daylight and lower temperatures, grains grow spindly and dwindle so that grains are used only for fodder or ensilage. Perhaps, it might have been necessary to gather seaweeds for fodder, which

could be found along the coast at low tide.

Their ingenuity includes the making of a dam and a network of ditches. In times of drought, water was led from the nearby river to farmers' fenced-in fields. During the wintertime, cows were confined in a byre well-insulated by turf while sheep were out all the year around. It is possible they might have been fed indoors during a severe spell of cold weather (McGovern 1980). Dwelling houses were often built of turf and stone, with some compartments.

While men were herding sheep outside, women would be preparing a meal in the kitchen. Butter and cheese made of milk were important staples. They were put in bowls that were made of wood or soapstone and stored in a pantry, which was well-ventilated. Perhaps, during the short daylight of winter, a spindle whorl may have been whirring all day long as women were weaving frieze clothes, which were an important item for trading to mainland Scandinavia.[29]

In middens in the front of their houses, a wide variety of animal bones were found. The main source of food was probably seals and fish, such as cod and salmon, with reindeer, hares, birds, and – of course – domestic animals including sheep, cattle, goats, horses, and – rarely – pigs.

Actually, Erik's farm, Thjodhlid's church, and the churchyard were located in the backyard of today's sheep farmers and the settlement's elementary school. Indeed, in 1961 when the boarding house for the elementary school was under construction, a number of human skulls were found by chance. The following archaeological excavation found that 144 human remains had been buried on the site, which proved the location of Thjodhlid's church and the churchyard (Krogh 1967:20 & 39). In other words, today's sheep farmers, such as

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[29] The word "frieze" means heavy, coarse woollen cloth with a nap, usually on one side only (*Concise Oxford English Dictionary*, 11th ed,, s.v. "frieze")

Big Oskar, Facetious Franz, the hulking Haggi and others appearing in Chapter 2, live in the same spots as the Norse lived, working on almost the same fields, and are engaged in the same occupation, as if they were repeating the lives of past people.

Today's Inuit sheep farmers' lives seem to be redolent of the above archaeological portrayal of the Norse life from a thousand years ago, even though Inuit farmers' houses are equipped with TVs, dish washers, showers, and other modern conveniences. Perhaps, if Erik the Red and his fellow Norsemen could have ever travelled to our times and looked around today's landscape of Qassiarsuk, they may not feel anything is foreign. The actual landscape may appear almost the same in their eyes, but they may gradually and obviously notice signs of new forms of dwellers' lives, from differences in size, colour, and the materials of buildings. Then, they would discover that the rhythm of the former lives of Norse farmers and the rhythm of today's sheep farmers' lives are intermingled in a fjord landscape.

Cathedral Church at Gardar (Igaliku): Norwegian progenitor Anders Olsen

Igaliku is the oldest "Inuit" sheep farming settlement in Greenland, and today it is the second largest in meat production, next to Qassiarsuk. Igaliku traces its roots back to Norwegian merchant Anders Olsen, but we need to start the description of the period before his arrival in 1783.

A couple of generations after the settlement of Erik the Red, the Cathedral Church was built at Gardar (today's Igaliku), where the Bishop would reside.[30] When a Norwegian priest Arnald arrived in

[30] The establishment of a bishop's resident was decided at a Thing at Brattahlid. Sokki Thorisson, a chief and the leading farmer at Brattahlid at that time, sent his

Greenland, he founded his episcopal seat at Gardar in 1126. Since Greenland had a church administration, which resulted in the ecclesiastical division of the Eastern Settlement (Krogh 1967, 1982; Arneborg 2000:311), the clerical and political centres were shifted to Gardar. Presumably, a *Thing* (Is., a democratic parliament, or an assembly, in the fashion of Icelandic tradition) was held at Qassiarsuk in the beginning of the Norse era, but later, a *Thing* would meet at Igaliku. Just like Hvalsey church, the Cathedral also had (cattle) byres, and goat/sheep sheds. In addition, a dike and irrigation system were built in the vicinity of the church.

In terms of sheep farming, the important period came after the demise of the Norse era. Danish colonization was initiated when Norwegian pastor Hans Egede was sent to Greenland by Denmark-Norway (a personal union) in 1721. He settled in an isle, named the Hope's Isle, near the outer coast of the fjord of the former Western Settlement, where he lived until the establishment of Godthåb, today's Nuuk, in 1728.[31] Already in 1723, Egede received stock animals, including five pigs, sheep, goats, and four cows, but ended up failing to keep them (Gulløv and Kapel 1971). Presumably, the outer coast was too cold to keep stock animals compared to the inner fjord, but it did not take long until the idea about animal husbandry was realized by Anders Olsen albeit in a much smaller scale and on a private initiative.

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son Einar Sokkason to Norway in order to bring the request for a Bishop to King Sigurd Jorsalfar. At this time, he brought a load of walrus tusks and skins and a live polar bear. As a result, a Norwegian priest Arnald was appointed by the king and consecrated as Bishop of Greenland by Archbishop Asser in Lund in 1124.

[31] The extinction of the Norse community was outside the assumption of the mainland Scandinavian countries for no bishop put foot on Greenland after 1378. In spite of this fact, the Bishop of Gardar was continually ordained until the first half of 16th Century, not knowing Norse settlements were extinct. Hans Egede, believing that a Norse community still existed, aimed to convert the Norse to Enlightenment Lutheranism with the support of King Frederik (McGovern 2000:327). When Egede reached Greenland, he was greeted by Inuit Greenlanders, descendants of the Thule people, instead of the Norse. Fifteen years after his stay in Greenland, he realized that the Norse had died out (Petersen 2000:342).

Having immigrated to Greenland in 1742, north Norway-born Olsen worked for the then trading company, *Handelskompagni*. During his business career, he was very active, establishing a trading post (Dan. sg. *udsted*) at Fiskenæsset (today's Qeqertarsuatsiaq) in 1754 and at Gammel Sukkertoppen (today's Kangaamiut) in 1755. During his stay in Godthåb in 1752, he married a local woman, Tupernat, who was baptized by Hans Egede when she was three years old in 1729. In the summer of 1774, KGH (the Royal Greenland Trading Department) was established, and Olsen was entrusted to find a suitable place for a new colony (Dan. sg., *koloni*; the largest station in each district) in south Greenland, which was to be named Julianehåb, today's Qaqortoq (Bak 1981:50-55). As Julianehåb was established in 1775, Olsen remained there as a merchant.

Having retired from the KGH in 1780, probably for health reasons, he started to work on a plan that he had been considering for a long time to enjoy a free and unhampered life. Olsen and Tupernat moved to Upernaviarsuk. After surviving a fire, they moved to Gardar in the fall of 1782, where they suffered from the winter cold in a half-finished house. After the winter, the family finally built a farm with cattle and probably some sheep. Here, the old Norse occupation resumed. The place the Olsens settled was called Itilleq (Gl. isthmus) at that time, and later called Igaliku (Gl. "the abandoned cooking place").

In early times, it was not difficult for Olsen and his descendants to obtain materials for their buildings. Simply, they took stones from the ruins of Gardar, and built their houses. A sheep farmer from Igaliku told me that it is said that the ruins became smaller year by year as Olsen's descendants took stones from them! For example, the two-metre-tall walls of the church and bishop's residence disappeared (Bak 1983:16). From the beginning of Igaliku to 1935, all the

Igaliku's residents were descendants of Anders and Tupernat. Anders died in 1786; Tupernat survived until 1789. Their son Johannes Anderson (1760-1826) continued his father's business and was succeeded by his son Poul Egede (1799-1860). Since his time, the family has taken the surname Egede.

Poul Egede had many children and the population rose from 19 residents in 1857 to 62 in 1900. It is said that more than 2,000 people who live in Greenland and Denmark can trace their ancestry to Anders and Tupernat (Bak 1981:55). During my stay in Qaqortoq, many people claimed that they were descendants of Anders Olsen and they were all related with each other through Anders and Tupernat, which often perplexed me, not having known Igaliku's genesis.

As seen above, the Igaliku landscape is made of various temporal cultural elements from the Norse and the colonial eras. Having been recycled, some parts of the Norse ruins were implicated in the establishment of new relationships to a new generation of dwellers and then became part of the buildings of a colonialist's descendants. In other words, the past relationships between humans and objects were revived to create new life cycles of the relationship. The unused part of the ruins, which was not under people's care, became desolated.

To follow Ingold's (2000:189-208) term "taskscape," dwelling means to be interwoven in the landscape, where constituents, animate and inanimate, are in the process of their own lifecycles, interrelating with others, and resonating with others' rhythms of lifecycles throughout the historical process. If we think this way, the Igaliku landscape clearly shows the dwellers' relationships to the land and objects from different eras. In addition, through kinship, quite a few people in southern Greenland share authenticity and antiquity through the landscape.

Garden landscapes of the missionaries, colonialists, and Greenlanders

Although they are not as majestic as Norse ruins, garden landscapes are another feature from which one can discover something about the lives of people, their enterprises, and the passage of time. Horticulture, or gardening, is the art of foreigners who needed to cultivate produce for their daily diet when they made homes in Greenland. They were mainly Danish missionaries, colony managers, and ombudsmen in towns, and German Moravian Brethren. In this respect, gardening in Greenland, which might be thought to be an adventurous attempt in the Arctic environment otherwise, has a long history, since Hans Egede's time. It is reported that Egede introduced turnips (Gl. *ruuat*) as an experiment to see if they would grow in Greenland (Kristiansen 1998:55).

A typical garden landscape includes a small kitchen garden established beside a house, particularly at the lee side of the buildings, behind earth berms, or other enclosures made of stones, to serve as shelter. The gardens were often fertilized by adding rich soil from nearby fertile places. To keep soil warm with solar heat, garden frames were made in the gardens. Bay windows were also used to grow vegetables and fruits.

In these frames, the missionaries grew cucumbers, tomatoes, and strawberries. Accordingly, even in northern Greenland, it was possible to grow carrots, cabbages, and different kinds of vegetables (Kristiansen 1998:57). Particularly, they liked to grow rhubarb.

The Governor of Greenland (Dan. *landsfoged*) in Godhavn (today's Qeqertarsuaq) had a small kitchen garden by his residential house, with bay windows that served as greenhouses in the

summertime.[32] Gardens are still found around old buildings, such as abandoned church and missionary housings, and in some cases rhubarb can be still found growing in them. Other than vegetables, ornamental flowers were also grown. A good example of a small garden is the Arctic Station in Qeqertarsuaq established by Danish botanist M.P. Porsild. He also planted flowers including chrysanthemums and alpine speedwell (Böcher 1977).[33]

Greenlanders, mainly in the Julianehåb district, took an interest in growing vegetables and in gardening from early on. Particularly, sheep owners in isolated areas needed to secure or supplement their diet on their own, and they thought it would be beneficial for them to grow vegetables. It would also provide them with a valuable source of income.

Horticultural experiments had already started at Upernaviarsuk by 1935, where Walsøe (see Chapter 4) laid out fields for making hay (Christiansen 1981:149). Upernaviarsuk had become a summer branch of the Sheep Breeding Station in 1939 (Kampp 1964:85). Experiments at Upernaviarsuk proved that vegetables most suitable for Greenland's natural conditions were turnips (Gl. *ruuat*), potatoes (Gl. *katorfilit*), carrots (Gl. *guleruuat*), and kale (Gl. *grønkålit*). Other than berries such as crowberry (Gl. Paarnaq, *Empetrum nigrum* ssp. *hermaphroditum*), Greenlanders' original vegetables are few, and one of them is angelica (Gl. kuanneq, *Angelica archangelica*). In other words, missionaries' and colonialists' attempts to make kitchen gardens led to adding more options to the Greenlanders' diet.

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[32] Before the establishment of the Home Rule arrangement, Greenland was divided into two, and the northern province was administered by Godhavn/Qeqertarssuaq; the southern by Godhåb/Nuuk. Landsfoged was the highest administrative authority for a province and was situated in both provinces. The term was used between 1925 and 1950. Here I translate it as "governor of Greenland."

[33] Morten Pedersen Porsild (1872-1956) was a Danish botanist. In 1906, he founded the Arctic Station in Qeqertarsuaq, which became part of the University of Copenhagen in 1956.

Particularly, I had an impression that turnips and rhubarb (*rabarberi*) had already been part of their diet. Today, sheep farmers grow a wide range of vegetables on their kitchen gardens, and so does the Upernaviarsuk Research Station. I saw turnips, radishes, and various kinds of lettuces and cabbages at Upernaviarsuk, and the Research Station officers tested various strains of potatoes and sold them in 2008. Consequently, garden landscapes connect the lives of the past and the present and at the same time, are the places which remind us of a foreign tradition being insinuated into Greenlandic society.

The study of Climate change in Greenland

So far, I have discussed a way of discovering meaning in the landscape by bringing in the perspective of the creation and maintenance of relationships between people and objects from both the past and the present. Natural scientists who study Greenland as well, also like to bring in the perspective of the passage of time, when it comes to the study of human relations to the environment in Greenland.

Danish climatologist Willi Dansgaard (1975; 1977) pioneered the discussion of the vicissitude of Norse society in relation to historical temperature oscillation (Figure 5-1). While Norwegian farmer Folke Vilgerdson failed to settle in Iceland in 865 because his animals succumbed to cold, Ingolf Arnarson's attempt at settlement (landnám) in 874 was successful. It was in 985 or 986 when Erik the Red "formally" established his Greenland settlement, but he actually lived in Greenland on a trial basis, exploring the southwestern coast possibly up to the Disko Bay region during 982-85, after he was banished from Iceland. He named the island Greenland because, to his eyes at least, the inner fjords of the southwestern coast were green

and fertile.

Why did these historical events happen?

According to Dansgaard's (1975) research on oxygen isotopes confined in ice cores from the Greenland Ice Sheet, having bottomed out in the middle of the 9th Century, the temperature was just starting to rise and peaked in the first part of the 10th Century. Although the temperature started gently to go downhill, it was still warm enough for Erik's colonization of Greenland to be successful. Again, the temperature hit the lowest point in the middle of 14th Century, when the Western Settlement was speculated to have died out. The temperature reached its highest in the middle of the 15th Century, when the Eastern Settlement was supposed to have gone extinct. Then, it declined again in the middle of 16th Century and hit a cyclical bottom again. This period is commonly called the "Little Ice Age."

When Hans Egede reached Greenland, the temperature was on the upward trend. Of course, although everything about human

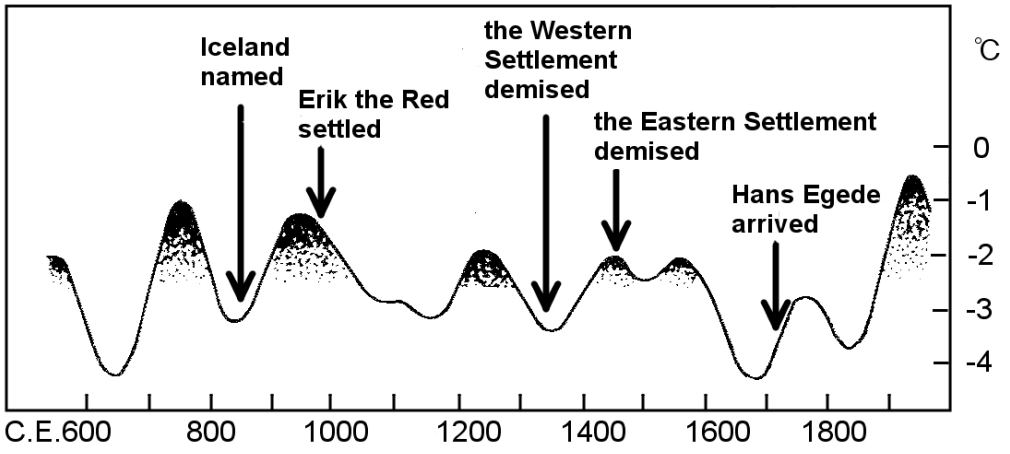

Figure 5-1. The relationship between annual temperature fluctuation and human activities

Source: Dansgaard (1987:85)

activities cannot be explained through only the change in temperature, the theory as such is very convincing. A recent study shows that the settlement and the abandonment of Palaeo-Eskimo peoples before the Common Era can also be coeval with an abrupt temperature change (D'Andrea et al. 2011) (Figure 5-1).

A temperature seesaw continued throughout the 20th century. During 1920-35, the temperature remarkably became warmer. Elderly sheep farmers remember this period and towns and settlements in southern Greenland flourished with cod fishing. Later, cooling sea temperatures in the 1960s and the 1970s allegedly led to the collapse of cod fishing industry. Coping with changes of this kind decided the fate of the towns. The town of Sisimiut successfully overcame a decline in Atlantic cod stock by shifting to shrimp-based fishing while Paamiut failed to adapt to a changing environment due to a heavy dependence on cod fishing and suffered a downward economic and demographic trajectory (Hamilton et al. 2000, 2003). Finally, for the past three decades, the temperature has become warmer again. The kinds of coping and adaptation used in the development of sheep farming will be discussed in the next chapter.

Concluding remarks: learning from the past

As seen above, it can be said that Greenland has historically been impacted by temperature oscillations more or less, and this view is well accepted by many Greenlanders. They can learn this fact from books and the media, but the scenes of Norse ruins, desolated fishing settlements and abandoned sheep farms in the fjord landscape tell them about the past lives of people and their relationship to the environment. In Greenland, the passage of time, cycles of human lives, and the human–environment relationship can be felt vividly by

discovering the landscape. Fjord landscapes convey a sense of continuity and discontinuity of human activities, and this serves as locals' frame of reference. They can understand the current state from the past. The past is channelled to the present through the landscape. Then, how do people envision the future? That will be explored in Chapters 7 and 8.

6. A History of a Sheep Farming Tradition in Greenland in the 20th Century: From Exogenous to Endogenous Development

A history of modern sheep farming in Greenland is a history of the trial-and-error adaptation process to the climate of southern Greenland. Its history was opened up by Danes outside Greenland but who held a far-reaching view of the future for Greenland. It was an endeavour of the creation of a new tradition. The idea for a future potential livelihood came from the past since Danes knew that Norse society flourished in the Middle Age based on animal husbandry. In this sense, Norse ruins scattering through southern Greenland inspired them to re-introduce sheep farming to the southern part of the island.

The purpose of this chapter is to examine the process of the making of a tradition within the adaptation process. When analyzing, I use the concept of "key persons" to represent agents of social transformation in local community and economy, borrowing Tsurumi's Endogenous Development Theory. Before we go to the body of this chapter, I have to point out that Tsurumi's theory does not smoothly fit into an analysis of Greenland's sheep farming case since she defines key persons as those who appear within the community. In this analysis, I include Danes into the category of key persons. Although they came from outside Greenland, they devoted themselves to developing sheep farming in Greenland. In this chapter I would like to describe how Greenlanders embraced this new tradition and how they made it their own, and how Danish authorities made institutions and regulations to support sheep farming during historical climate

change. Incidentally, before Denmark's introduction of sheep farming, in the 18th and 19th centuries, missionaries and Colonial Administrators in Greenland made several attempts at sheep farming. I briefly review this period in Box 4-1 and do not deal with it in the main body.

The incipient stage of the introduction of sheep farming

Let us start a history of modern sheep farming in Greenland from the beginning of the 20th century. I analyze how it started and how the re-introduction of sheep farming was carried out. I take up two key persons from this time period: Jens Chemnitz and Lindemann C. R. Walsøe.

Impetus of the re-introduction of sheep farming to Greenland

Hobsbawm and Ranger (1992) demonstrate that some traditions, while thought to originate in the distant past, instead are rather recent. In south Greenland, present day sheep farming traces its origins to the beginning of the 20th Century during the Danish initiatives undertaken by the Board of Greenland (Dan. Grønlandsstyrelse).

It is accepted among Greenlanders that the background of these Danish initiatives was a decline in the seal catch at the turn of the 20th Century. A warming sea temperature pulled the seal population off the Greenland coast, dealing a significant impact to Greenlanders' traditional mode of production – hunting. The Board of Greenland promoted a new economic basis for Greenlanders to cope with the deteriorating living conditions (Berg 1972; Rasmussen 2000). In effect, during fieldwork in southern Greenland, older sheep farmers related to the origin of present day sheep farming with a decline in the

seal catch. However, a closer look at the statistics brings this into question (Figure 6-1). While the seal catch did begin to decline in the early 20th Century, with a significant decline in the 1906-07 season, it was after the 1910-11 season that a downward trend was first observed. It is hard to think that this level of a decline in seal catch moved the Board of Greenland to take such prompt and effective measures. As Sørensen (2006) suggests, it would be more likely that a political upheaval in Denmark rather than a decline in seal catch brought this particular initiative to Greenland.

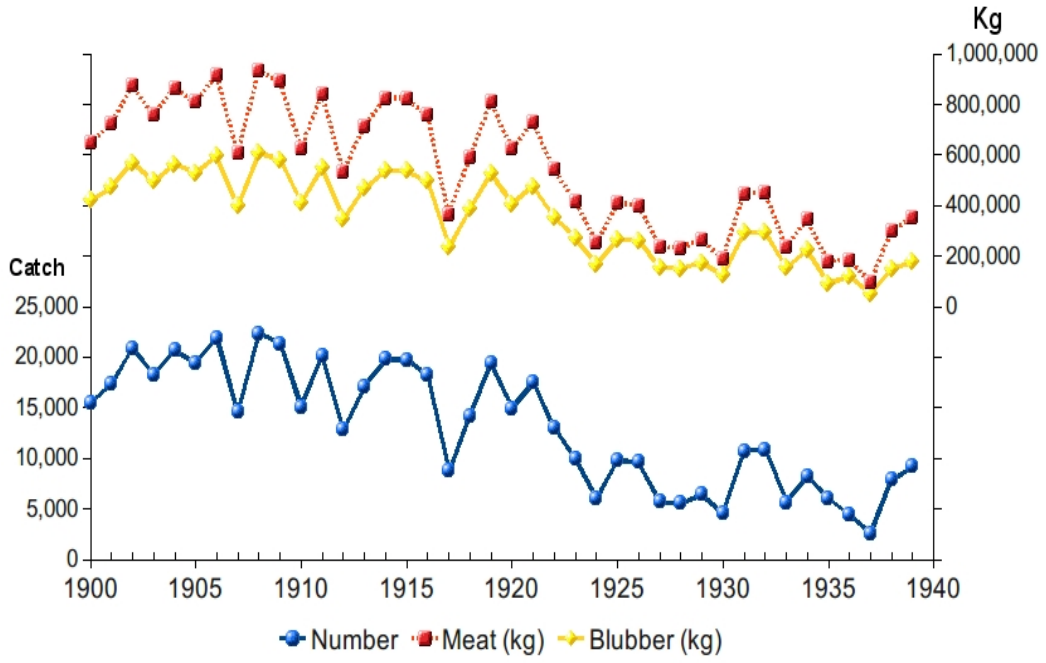

Figure 6-1. Seal catch and meat and blubber production between the 1899-1900 season and the 1938-39 season

Source: Ibsen and Sveistrup (1942)

In 1901, Denmark experienced significant changes to its political landscape; the Liberal Left replaced the Conservative government.[34] This regime shift (Dan. *systemskiftet*, "the change of a system") provided momentum for political and social reform in Denmark, such as liberal oriented ruling policy towards Greenland. The Danish Parliament passed the *Act of 1905*, which is the first act adopted in Denmark for Greenland, with a specific aim to improve both the church and education system in Greenland. Danish Parliament favoured uplifting Greenlanders' economic and education systems as a means to promote self-reliance and local culture.[35] Therefore, as Hobsbawm and Ranger (1992) point out, a new tradition is created when the existing tradition becomes inapplicable or inadaptable to a new situation, such as social and political transformation and ideological movement.

Key person 1: Pastor Jens Chemnitz

Aware that the Norse settlers based their livelihood on animal husbandry, Danish authorities considered the possibility of keeping domestic animals in south Greenland. In 1906, the director of KGH Carl Ryberg formed a committee to consider the possibility of cattle-

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[34] Progressive liberals from towns and wealthier farmers supported the Liberal Left. Rallying points included: governing by people, social equality, and intellectual freedom. For people on the left wing, the way the Board of Greenland's methods of rule in the colonial territory was a target for criticism. Danish reformers, such as author and explorer Ludvig Mylius-Erichsen and C.W. Schultz-Lorentzen, criticized the management of KGH in Greenland, the exclusion of Greenlanders from politics, and a lower standard of living compared to Denmark.

[35] As a result, a teacher training college (Dan. *Grønlands Seminarium*, Gl. *Ilinniarfissuaq*) in Nuuk, which was built in 1847, was rebuilt in 1907. The Danish expeditionary vessel Tjalfe conducted exploratory fishing in Lichtenau Fjord in 1909, which resulted in the start of the Greenland halibut fishery, and most of the fish bought was salted in barrels and exported to Denmark (Bowering and Brodie 1994:122). The introduction of sheep farming was part of this economic promotion by the Danish authorities.

raising. As a result, Ryberg appointed Pastor Jens Chemnitz (1853-1929) of Frederiksdal (Narsarmijit or Narsarmiit, otherwise called Narsaq Kujalleq) to test the feasibility of sheep farming in south Greenland. Chemnitz was the right person to seek out this new opportunity in Greenlandic livelihood.

Jens Chemnitz was born in 1853 in Østprøven, a now abandoned village lying between Nanortalik and Kap Farvel. His father was a German settlement manager (Gl. *niuertoruseq*), and his mother was from Igaliku and a descendant of Anders Olsen and Tupernat (see Chapter 5). After receiving an education at the college in Nuuk, Chemnitz entered the priesthood in Copenhagen and then later returned to Greenland (Kristiansen 1998: 22-23). In a sense, he had insight into Greenlanders' lives and was sympathetic to them. For example, as pastor in Holsteinsborg (today's Sisimiut), he stopped Scottish fishermen from hiring the town's men as labourers on fishing vessels during the summer. The wages paid were paltry, and in addition, the families without men, who were otherwise engaged on the fishing boats, were unable to prepare for the following winter. As a result, some families suffered hardship in the wintertime (Petersen 1991:95-96).

Chemnitz also had a practical side to his thinking when it came to the improvement of Greenlanders' lives, probably under the influence of Danish priest, author and reformist N.F.S. Grundtvig. When he was later transferred to Frederiksdal in the Kap Farvel region, he encouraged the local people to begin shark fishing because he had seen the locals suffering hardship in the wintertime due to bad catches of seal in the preceding summer. Occasionally, he had worked for an individual and social welfare incorporation of Denmark.

We can learn much about the initial stage of the introduction of sheep farming from writings such as articles and letters by the people

who were involved. In 1906, when appointed to launch sheep farming on a trial basis, Chemnitz was staying in Copenhagen under residence permission (Bak 1981:85). He was not sure if he could pursue this project, being in holy orders at the same time. With his superior Schultz-Lorentzen's encouragement, he decided to take on this task.

On his way back to Greenland, he spent part of summer 1906 in the Faeroe Islands to familiarize himself with sheep farming and he bought equipment for animal husbandry. In the middle of October, nine ewes and two rams were brought by the trading ship "Hans Egede" to Julianehåb (today's Qaqortoq) and were later sent to Frederiksdal (Bak 1981:85). All animals were emaciated, but before long, they all put on weight. The Faeroese adviser Effersøe recommended keeping the rams in cages until December (Egede 1966:20-21). In addition, Chemnitz received instructions from KGH to record lamb birth/mortality and annual sheep population, along with detail accounts of business profits and expenditures (Petersen 1991:97).

The records of the year-to-year number of sheep remain still accessible. The following spring, May 1907, six lambs were born, three of which were rams. In 1908, 11 lambs were born, six of which were rams. In October the same year, a total of eight ewes and ewe lambs arrived from Denmark (Kristiansen 1998:20-21). Effersøe vaccinated the sheep before they left Denmark; they were deloused on arrival. In 1909, Chemnitz received six Scottish sheep (five ewes and one ram), which had belonged to the district doctor Deichmann.[36] During the winter, these sheep were in poor condition, and Chemnitz sold them to people in Julianehåb.[37] Afterwards, the number of sheep

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[36] Early in the 20th century, Deichmann in Julianehåb purchased Scottish sheep by way of experiment, but it turned out that it was more than an individual could manage to introduce a new occupation.

[37] He sold blacksmith Peter Høegh and ajoqiuneq, sub catechist, Johan Dahl.

slowly increased, bringing the total to approximately 70 in 1915, when Chemnitz handed them over to Walsøe (see below).

During the nine years between 1906 and 1915, an interest in sheep farming began to grow in south Greenland, and more people, including hunters and officers, wanted to raise sheep. Chemnitz arranged for them to buy sheep on credit, which they could repay after their experiments went well. Among them was Amos Egede from Igaliku.

In 1914, he bought three sheep for 25 kroner, reintroducing sheep farming to Igaliku. Greenland's Common Fund (Dan. *Grønlands Fællesfond*) was a KGH initiative, which contributed 20 percent of the value of the products it bought from local hunters, and this fund supported Chemnitz' experiment. As a positive result of Chemnitz' experiment, the Board of Greenland expressed a strong interest in promoting sheep farming further and on a larger scale.

Key person 2: Lindemann C. R. Walsøe

The other key person in this history of sheep farming in south Greenland was Lindemann Carl Reinhold Walsøe (known to Greenlanders as "Walusuut" 1880-1936). His interest in sheep farming began as a bricklayer on Australian and Nevada sheep farms in his youth. After receiving the rank of lieutenant at a military academy in Denmark, Walsøe served for the Danish army.

In 1912, he heard about the sheep farming project in Greenland and applied to the Board of Greenland as a volunteer for the project. The Board initially declined his application, but the following year requested him to go to Greenland. Arriving at Julianehåb, Walsøe set on tours of various areas of south Greenland by boat and on foot where he surveyed soil conditions and vegetation of the land from

Tunulliarfik Fjord to Frederiksdal. Afterwards, he determined three areas suitable for sheep farming: the Narsaq area between Sermilik Fjord and Tunulliarfik Fjord; the Julianehåb area between Tunulliarfik- and Igaliku- Fjorden; and the Lichtenau (today's Alluitsoq) area between Igaliku- and Alluitsoq- Fjorden.[38] Overall, he concluded that the hilly, lush terrain of the area ranging from Tunulliarfik to Tasermiut could well support the operation of sheep farming, although the large scale of farming such as one undertaken in Australia was not possible. During this survey, he witnessed Igaliku residents raising approximately 20 cattle, and met Jens Chemnitz at Frederiksdal.

The promotion of sheep farming

The Sheep Breeding Station at Julianehåb stimulated Greenlander's interest in sheep farming and then inspired Greenlanders ventured to make a living by sheep farming.

The establishment of the Sheep Breeding Station at Julianehåb

With Walsøe recommendation, the Board of Greenland decided to create the Sheep Breeding Station in Julianehåb. The purposes of the Station were to promote the appropriate operation of sheep farming in southern Greenland and possibly into western Greenland. In 1914,

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[38] He reported that Qingua Dalen was the most luxuriant place in Greenland (Kristiansen 1998:35). He observed birches and willows forming scrubland, with their height being 4 to 5 metres (as for vegetation, see Chapter 6 on plantation). There were Norse ruins made of granite boulder that could still be used for keeping sheep. The place, unfortunately, was difficult to travel to and from Tasermiut Fjord, and he concluded it was a right place to set up sheep farms. He also observed that the area around Frederiksdal was also fairly lush, but that pasture was not large enough to keep a large sheep population. After all as one goes southerly, the vegetation decreased and became wilder.

Walsøe visited Iceland to familiarize with sheep farming in this other northern island. While there, he bought sheep in North Iceland. Herding them to Reykjavik, he loaded 179 sheep and two Icelandic horses into the trading ship "Hans Egede". On his way to Julianehåb, four sheep died, but the rest of the sheep were safe and sound. When arriving at Julianehåb, Walsøe gave an unforgettable impression to the local people, riding on a horse, driving sheep to the hills (Kristiansen 1998:15).[39] The sheep were deloused and temporarily kept in *orsivissuaq* (Gl. a big storage for seal blubber) until the Station was ready. The following year, a sheep barn was built using the hillside as one of the barn walls. It was hard work for Greenlanders, having nothing but crowbars, hammers, and scythes for building tools (Kristiansen 1998:25-26). In the fall of 1915, the Sheep Breeding Station opened with 175 Icelandic sheep, and 70 Scottish sheep previously kept by Chemnitz. Although, other Icelandic sheep were added later, the 245 Icelandic sheep became the origin of today's 22,000 sheep.

Due to World War I, the Station would not begin operations (Bak 1981:85). The fields on "the flat" (Gl. *Narsarsuarmi*; Dan. *store sletten*) were still being tilled on its property, from which to secure winter fodder.[40] Walsøe also laid out fields at Upernaviarsuk, further back into the fjord from Julianehåb. In 1920, a farmhouse was completed, above which rabbit hutches were set up in the early 1930s. While Walsøe was keen to raise rabbits, this interest did not continue in others after his death.

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[39] The Greenlandic word for horse is *hiisiti*, which came from the Danish word *heste*. Presumably local Greenlanders had never seen a horse before.

[40] Then called "Narsarsuaq." The fileld lies back of where today's business school stands towards Tasersuaq, at which the Sheep Breeding Station was planned to be built (Schultz-Lorentzen and Vadstrup 1993).

The training course at the Sheep Breeding Station

In 1917, the station offered three to four years of apprenticeship training. The first trainee was Jacob II Egede from Igaliku, a son of Amos Egede and also later a poet and a famous organ player. He trained at the Station between 1917 and 1920, and after that, he borrowed 27 sheep from the Station to start sheep farming. Yet, Jacob II Egede did not carry out sheep farming as a primary occupation after all. In 1919, the Board of Greenland issued a regulation outlining how Greenlanders could obtain sheep (Bak 1981:85). Trainees, as well as trusted individuals, could borrow sheep after their apprenticeship, in order to begin sheep farming, on condition that they would return the same number of lambs as they had borrowed. In addition, they could choose the land for free according to their sheep farming plans, which is still in effect today (Petersen 1991:100). In this way, Walsøe, as Station Manager, attempted to distribute sheep in small flocks to interested people.

Key person 3: the first Greenlandic settler for sheep farming, Otto Frederiksen

Back in the 1920s, the colony of Julianehåb was expanding. Although the population remained at approximately five hundred residents, it was not difficult for the Station to recruit workers from the colony. The Station hired a carpenter, Otto Frederiksen ("Ottooraq", "little Otto" as a Greenlandic nickname), a great grandson of Anders Olsen's son Johannes, reportedly with German heritage. Having worked as a *kiffaq* (Gl., helper or handyman) for the Station for five years, Ottooraq decided to become a full-time sheep farmer (Kristiansen 1998:55).

The place where Ottooraq materialized his grand plan was

Qassiarsuk. In those days, Qassiarsuk was the place where the Station members and people from Narsaq regularly gathered grasses and brushwood for their sheep and cattle. Sometimes, they caught *ammassat* (Gl. pl., capelin) to dry the fish for supplementary fodder. During this time, Qassiarsuk was a temporary habitation site. A retired *laaja* (Gl. a temporary worker) named Hermann settled in Qassiarsuk for a short time (Kristiansen 1998:27).[41]

Ottooraq received good support from Walsøe, and the Provincial Council (Dan. Landsråd, the former legislature before Home Rule government) granted Ottooraq a loan of 3000 DKK to build housing and sheep barns. The Ministry placed a condition for the loan that each time Ottooraq supplied his products, a third of the proceeds was withheld for the instalment of the debt. The Station also loaned 145 sheep to him. Until 1924, the Station had lent a small number of sheep to each farmer candidate; that Station had a large stock of sheep to rent out.

On July 30, 1924, Ottooraq arrived at Qassiarsuk with his eldest daughter Marie, and an elderly couple and their sons as his assistants. During the summer, Ottooraq and his colleagues lived in a tent while they built a house and a sheep barn, which were fairly completed by the fall. The barn was built of turf similar to how the Norse constructed their dwellings in the past. Actually, Ottooraq's father was born in Denmark, and Ottooraq's wife Elizabeth, had family from there. Nearly 450 years after the extinction of the Eastern Settlement, people with Scandinavian heritage were once again starting sheep farming at the same spot.

It was a grand plan that Ottooraq decided to conduct sheep farming as his primary occupation because sheep farming was thought

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[41] This Greenlandic word comes from the Danish word *lejet*, which means "hired" in English.

to be as *tapertaq* (Gl. a supplement, in this context, a sideline) in those days. According to Walsøe's idea, there were three types of sheep farming based on the flock size one could keep (Petersen 1991:98-99).

The first type was hunter and fisher families keeping up to 10 sheep. This flock size would not hinder families from keeping their primary occupation alongside with husbandry because it would not take much time to secure enough winter fodder for sheep. Accordingly, heads of the families would continue fishing or hunting as their primary occupation.

The second type was keeping up to 50 sheep. This flock size still would not hinder their primary occupation, but it required more spare time for sheep farming. For example, building a certain size of sheep barn and cultivating grasses would be necessary. After shearing wool in the spring, the families would be able to focus on their primary occupations for the remainder of the summer. With this flock size, sheep farming still would not go beyond the level of a sideline.

The third category would be a family keeping from 100 to several hundred sheep. With this flock size, families would engage in sheep farming as their primary occupation. In addition, families in this third group had no choice but to live away from the inhabited areas. Ottooraq's plan focused on this third group.

In the fall of the same year, Elizabeth and their three young children settled in Qassiarsuk, they brought with them 145 sheep and settled in a small dwelling. The sheep barn Ottooraq built was small, but it could not be helped. It was difficult to secure both enough winter fodder and to build a barn in the summer. As winter approached, anxiety began to weigh heavily on their hearts because it was quite challenging for these town people (Gl. *illoqarfimmiut*) to spend a winter at such a remote place with limited supplies. As long as the fjord was open, it was still possible for Ottooraq to paddle his

kayak to Narsaq or Julianehåb to purchase supplies. When the sea froze, he walked for six hours on the ice to Igaliku; a journey that he made several times during the winter of 1924-1925. However, travel was made impossible when foehn winds broke the fjord ice.

Ottooraq and his followers survived the harsh winter in this remote area; their successful overwintering pleased Walsøe. In 1926, Ottooraq bought some calves from Igaliku, and in the following year he purchased a horse from Ivittuut. In three years, he "paid off" all the sheep he rented by delivering the same number of lambs to the Station. In 1930, he also paid the final installment for a cash loan.

By 1930, Qassiarsuk attracted more settlers. The population gradually grew and it reached 125 with 11 independent sheep farmers in 1936. These farmers had training at the Sheep Breeding Station at Julianehåb. By the 1935-36 winter, totals of 1198 sheep, ten cows, seven horses, one goat, ten dogs, and 57 chickens were found in Qassiarsuk. Around 1938, Ottooraq also had 650 sheep, two cows, one bull, three goats, 20 chickens (Bak 1981:91).

Sheep farming taking hold in Greenland

With the government providing organizational assistance, sheep farming gradually took root in Greenlandic society. The new business expanded not only in southern Greenland, but also to western Greenland. Areas for sheep farming overlapped places in the Eastern and the Western Settlements of Norse Greenland.

The growing number of sheep farmers

Two decades passed since the establishment of the State Sheep Breeding Station, Station Manager Walsøe was confident that sheep

farming was a success and taking hold among Greenlanders. In 1935, Walsøe wrote as follows:

> It can be said that sheep farming has already been a well-established occupation for this generation of Greenlanders. The younger generation is around sheep farmers and sheep from their early childhood and have the practice and understanding of sheep farming that can be fully explored when they grow up. It will take, at least, one generation to create the pastoral population from the hunter population. The current sheep farmers' children – it is they who will lead sheep farming further. [Bak 1981:91, original source unknown in Danish, with my translation]

In effect, the number of sheep in Greenland was steadily increasing in those days. It all started from around 200 in 1915, and had already reached 1,000 in 1922, and then exceeded 3,000 in 1927 (Figure 6-2). By 1930, the number of sheep surpassed 5,000, and as

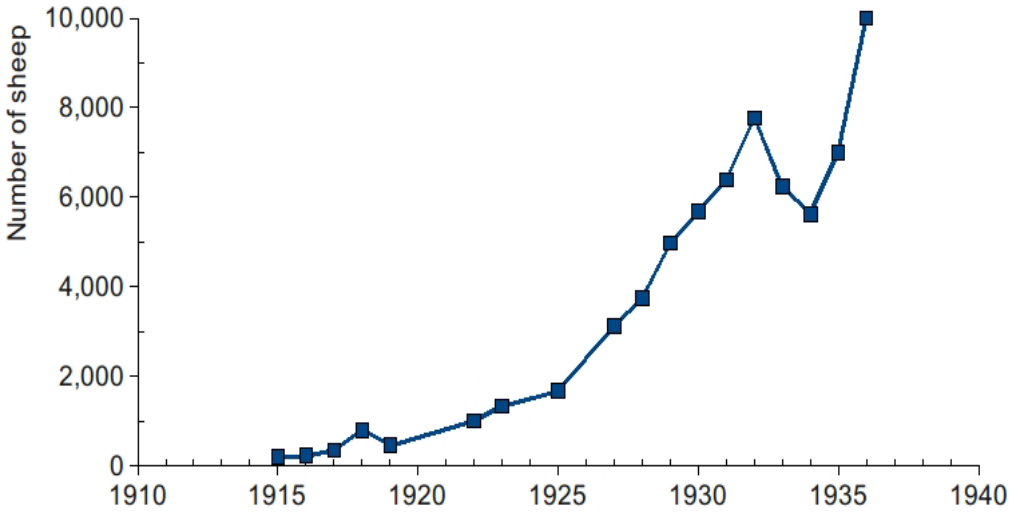

Figure 6-2. Increase of owned sheep between 1915 and 1936

The number of sheep in 1936 reached approximately 10,000. The numbers in1920, 1921, 1924, and 1926 are missing.
Source: Kristiansen (1998:66-67)

early as 1936 it had reached approximately 10,000. In the beginning, a few Greenlanders were interested in sheep farming, but more began to realize the importance of it. The number of sheep owners increased from 81 in 1923 to slightly over 200 in 1936 (cf. Figure 6-3). This increase was mainly assisted by the easy terms under which Greenlanders were able to get possession of sheep from the Station and the building loans for sheep barns as well as residential houses that they were provided through the Board of Greenland (Kampp 1964:89).[42]

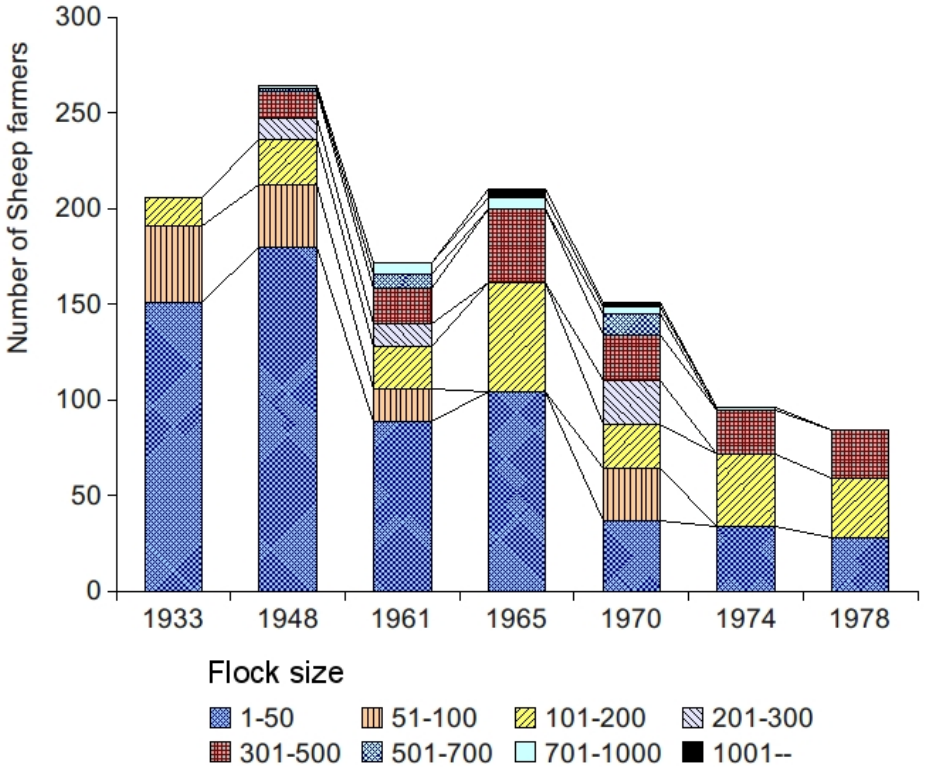

Figure 6-3. Sheep flock size and number of sheep owners

Source: Berg (1972); Christiansen (1981:151-152); Kristiansen (1998:68-70)

[42] At the time when Kampp (1967:104) wrote his article, an apprentice who had finished his training could rent 200 ewes from the Upernviarsuk Research Station without interest for 8 years. Until the sheep were repaid, he owned none and was only allowed to sell to the sheep breeding stations.

Statistical data provides a numerical picture of the scale of sheep farming during this time. Between 1919 and 1934, 12 apprentices rented 1,135 sheep from the Station, with the size of each rented flock ranging from 27 to 145 sheep. Except for one apprentice, all continued sheep farming. In 1933, the number of apprentices' sheep increased to 1,515. The largest flock a single sheep owner owned was 325. Three apprentices completed the "payback" of their loans, sending to the Station the same number of lambs as they had rented, while the remainder were still in "debt" of 339 sheep.

During the same period, 77 residents of Greenland (other than apprentices) rented a total of 761 sheep from the Station. Three sheep keepers passed away, and five stopped keeping sheep. In 1934, the number of sheep these people owned amounted to 1,982 in total. In addition, 120 residents gained possession of sheep without going through the Station; the number of their sheep was 1,957.

The statistic shows in 1933, Greenlanders owned 6,244 sheep. While the Sheep Breeding Station held approximately 800 sheep, 206 residents of Greenland owned the remainder (Figure 6-2). Only 15 individuals owned more than 100, 40 individuals owned between 25 and 100, and 151 individuals or 73 percent of the total, owned fewer than 25 sheep (Figure 6-3). Therefore, on average, one person owned 26.5 sheep. It is clear that the majority of sheep owners combined sheep husbandry with their primary occupations. Noteworthy were sheep farmers' associations created in various areas to mutually help with farming chores, such as collective round-up, and to address farmer's issues and help communally to solve problems related to sheep farming.

Sheep farming outside southern Greenland

The Julianehåb district ranging from Julianehåb to Frederiksdal (today's Narsarmijit), was – and still is – the place for sheep farming in Greenland, yet there were attempts at sheep farming in more northerly regions, namely the Arsuk and the Godthåb areas. In 1932, a branch of the Sheep Breeding Station was established at Godthåb to raise interest in sheep farming.

In those days, a good deal of cod was caught off the coast of Godthåbsfjord, which created plenty of jobs for local people. As a result, sheep farming did not win much popularity among the people in the Godthåb area.

In 1947, as the town increased in size, the branch moved to Qooqqut, further up the fjord. While KGH owned 414 sheep; the two sheep farming settlements, Kapisillit and Neriunaq, which were further back from Qooqqut into the fjord, owned only 215 sheep. Accordingly, the branch station no longer had any purpose for private sheep farming. I am not certain when the branch station officially stopped its effort to encourage sheep farming, but it did stop at least by the late 1950s (Christensen 1957a:76) and continued as an ordinary sheep farm in the 1960s (Kampp 1967:90).

On the other hand, sheep farming took hold in north and south Frederikshab (today's Paamiut), namely in Avigait and Arsuk. Between 1930 and 1940, when Jens Chemnitz' son Nikoraj Chemnitz was a colonial manager of the district (Dan. *kolonibestyrer*) and, due to a large part of his contribution, sheep farming spread among the Frederikshåb district (Christensen 1957a:76). For a recent example, in 1962 20 groups owned 1,050 sheep (Kampp 1964:91). Although Avigait has been long since abandoned, as of 2009, a sizable sheep population remains in Arsuk. According to Kampp (1964:91), Arsuk,

which is located a short distance farther back in the fjord and farther back from the settlement of Ivittuut, was a relatively favourable place for sheep farming in terms of its vegetation. Sheep could be kept without sheep barns in Arsuk because they could survive on willow bushes, heath, and, if necessary, seaweed.

Research projects to accumulate knowledge, skills, and networking to other Nordic countries

The support of the Board of Greenland and the Sheep Breeding Station assumed a significant role in popularizing sheep farming among Greenlanders in the first half of the 20th Century. The role of the Station was to accumulate experience in sheep farming and carry out research in order to gain techniques and technology suitable to Greenland's conditions. To enhance the effectiveness of the Station, the Board of Greenland planned to recruit staff members, occasionally sending research staff members abroad to learn of sheep farming techniques. The following are major activities coming out of the Board of Greenland and the Station.

1) The Station Manager Walsøe made trips to Norway, Scotland, and the Shetland Islands to study sheep farming in these countries;
2) In 1926, the Station hired an assistant, K.N. Christensen, who held a master's degree in agriculture. His specialty was pedology (soil science). After Walsøe's death, he was appointed as the Station Manager;
3) In 1931, the Station hired Icelander Sigurd Stefansson as sheep caretaker. In 1934, he was transferred to a newly created Sheep Breeding Station at Nuuk;
4) In the early 1920s, the art of carding, spinning, knitting, and

weaving was introduced to Greenland. Between 1921 and 1923, an Icelandic woman, Ranveg Lindal, stayed in Julianehåb and offered spinning classes to the town people and neighbouring settlements. She also offered classes for cooking sheep products and conducted experiments on vegetable dyeing (Bak 1981:94; Kristiansen 1998:51-53);

5) In 1936, the Station called agronomist Louis A. Jensen (1911-92), who afterwards reached his retirement as a Station Manager in his old age (Kristiansen 89). In addition, in order to widen possibilities for farming in southwestern Greenland, the Board of Greenland invited agricultural experts to Greenland and had them conduct research to make recommendations from it. This research served to obtain more comprehensive overview of arable land of southwestern Greenland;
6) In 1923, Icelander Sigurd Sigurdsson was invited to Greenland to carry out a study tour, which covered most of the Eastern Settlement. He submitted a report to the Board of Greenland;
7) In 1925, the two Norse settlements were investigated in terms of soil conditions, which were to help estimate the extent of arable land in western and southern Greenland. While Faeroese Ejnar Knudsen investigated the Western Settlement, State consultant K. Hansen investigated the Eastern Settlement.
8) The same year, O. Bendixen made an inspection tour of southern Greenland in order to grasp situations of farming and animal husbandry. He published a book, *Grønland Som Nybyggerland* (Greenland as a settler's country);
9) In 1937, Sigurdsson again made a tour and widely observed Greenland's colonies, such as Uummanaq, Godthåb Fjord, the

Sheep Breeding Stations at Godthåb and Julianehåb, and Narsaq, where cultivation experiments were underway.

The slaughterhouse and its contribution to the economic development of Julianehåb

In the Julianehåb district, other facilities gradually developed. In 1929, a slaughterhouse was built at Julianehåb and began operations. Before the slaughterhouse, sheep owners killed and butchered their own animals (Bak 1981:89).

According to Louis Jensen, who moved to Julianehåb in 1936, only 600 to 700 people lived in the town (Kristiansen 1998:79-81). The Sheep Breeding Station and the slaughterhouse were both a significant presence in the town's landscape and their economic effects. The town of Julianehåb received raw wool, and a significant number of the town women processed the wool. In the summer, the women wore white coats as they scoured raw wool behind the small church in the middle of town. The scoured wool was stored in the loft of the slaughterhouse.

The slaughterhouse would hire between 50 to 60 people to help process the animals. Most of the meat was salted and exported to Iceland and Canada. In addition, the whole, unfrozen lamb carcasses were shipped to many regions of Greenland.

In those days, there was no equipment to deal with freezing cargoes. Accordingly, it was needed to slaughter all the sheep in a short period of time and load them on aboard. When informed that a ship was doubling Kap Farvel, they started slaughtering, so that when the ship arrived at Julianehåb, all the lamb carcasses had already been put into crates. The ship took them on board and transported them to other towns. The slaughterhouse dealt with 180-200 lambs

per day, with 400 lambs at the most, and up to 4,000 lamb carcasses were loaded on a single ship.

During World War II, tallow, produced before the war, was mixed with cottonseed oil to make it lubricate better. According to Jensen, even pigs were kept during the war. A canning factory was built, and blood sausages, liver paste, mutton salami, and smoked lamb meat were produced by way of experiment. These products were shipped throughout the coastal regions of Greenland.

The canning factory was used for producing canned shrimp outside the slaughtering season. At that time, shrimp fishing was an emerging business opportunity. In 1950, the first operation was carried out in the southern Greenland district, with the catch amounting to 12.8 tons. The catch increased to 19.9 tons in 1951, and to 145 tons in 1952. Accordingly, the shrimp production at the slaughterhouse in Julianehåb was placed in the second after Holsteinsborg (today's Sisimiut).

Several factors brought about the eventual closing of Julianehåb's slaughterhouse. At the end of World War II, lamb products were shipped to Denmark, the connection to which had been interrupted due to German occupation. Denmark required Greenland to begin conducting veterinary checks while in 1948, the number of ewes increased to nearly 22,000. That year, approximately 12,000 lambs were slaughtered. Julianehåb's slaughterhouse was too small to deal with the increased number of lambs and to comply with veterinary requirement. There was a plan to renew the slaughterhouse in Julianehåb, together with a plan to build a power plant, but it was not materialized. There was simply not enough space in Julianehåb. Since a good shrimp fishing ground was near Narsaq, it was decided to build a new cannery together with a new slaughterhouse in Narsaq. The year 1951 was the last that

slaughtering took place in Julianehåb and since 1952, slaughtering has been taken place in Narsaq.

Suffering from severe winters

While sheep farming was getting underway, sheep owners were hit hard by severe winters in 1948-49, 1956-57, 1966-67 and learned of the losses that could result from the animals grazing outside throughout the winter.

Severe winters, 1948-49 season

A sheep farmer from Qassiarsuk shared with me his photographs. They were from the 1960s or earlier and showed farmers shearing wool during the spring. I knew that sheep farmers in those days rounded up sheep not only in the fall but also in the spring.

Contrary to the current practice, sheep were let to graze loose on hills and mountains all year around, even during the winter months. Until the spring round up, farmers did not know how many lambs were born in the mountains during the winter. After counting lambs, they sheared wool and let the sheep out again to the mountains.

Harsh winters with strong foehn winds were detrimental to sheep herds in the mountains. The snow on the ground melted by a warm, dry foehn wind, but soon froze in the following cold weather. This made it difficult for sheep to dig out grasses under the ice layer. In those days, many sheep starved to death in the mountains. Surely, the loss caused by harsh winters delivered a significant financial impact to the sheep owners whose livelihood was mainly based on sheep farming.

The 1937-38 season was a severe winter (*katastrofevinter* often

described in Danish literature), which reduced 8,241 ewes to 5,427. More disastrous was the 1948-49 winter. By spring 1948, the population of ewes reached just under 22,000, which was the highest level ever in those days; however, the following winter reduced it to approximately 9,000. The state offered farmers emergency loans, which were still not sufficient to compensate for their losses (Christensen 1957a:76).

The relocation of the Sheep Breeding Station to Upernaviarsuk in the course of modernization

Following the work of the 1949-1950 Greenland Commission (Dan. *Grønlandskommissionen*), the Danish initiative formed a ten-year modernization plan for Greenland (known as G-50) to solve problems concerning Danish colonial control and Greenland's autonomy. This plan also introduced a new scheme into the sphere of sheep farming. Through housing and occupational supports, it was possible to obtain a loan not only to build houses and sheep sheds but also to purchase agricultural equipment.

By the 1950s, the town of Julianehåb and the Sheep Breeding Station expanded in size. As a result, the Station moved to Upernaviarsuk in 1955. With this relocation and the change in scope to include sheep farming, cultivation, gardening, and tree-planting the station's name changed to the Upernaviarsuk Research Station (Dan. *Forsøgsstationen Upernaviarsuk*). Thus, Upernaviarsuk became a place for apprenticeships for would-be sheep farmers and practical experiments for haymaking, fodder making, and horticulture. The Station Manager, K. N. Christensen, and advisory staff members carried out the advisory and consulting activities by making a trip from the Station to the sheep farms on a regular basis. The new

Station built a sheep shed, barns, a boarding house for apprentices, machinery garages, and living quarters with a classroom.

During this time, Danish genetics professor Jørgensen established small plantations and nurseries on the Station's property for the tree planting projects (see Chapter 8). By this time, the Station had a fully developed apprenticeship system. The Upernaviarsuk Station and Greenlandic sheep farmers established personal relationship with sheep farmers in other Nordic countries, especially Iceland and Norway, which enabled the exchange of practical experience. For example, I heard from the Agricultural Advisory Office that as early as 1931, a farmer from Qorlortorsuaq, a location of the current hydroelectric power plant, trained in Iceland (see Map 7-1). Moreover, this type of training abroad was a KGH idea.

In addition, while this modernization plan transferred the Station's administration to Greenland's department, the meat production remained under KGH. Soon, it turned out that a separate leadership was impractical and, in 1956, KGH acquired the administration of the Research Station (Christensen 1957a:77).

At the same time, two co-operative committees were established: one in Greenland and the other in Denmark (Christensen 1957b; Christiansen 1981:149). The Greenlandic committee was responsible for the Research Station and consisted of three representatives from different farming areas (i.e., representatives from different sheep farmers' associations), the Station Manager, and factory manager from Narsaq and trading manager (i.e., KGH). The committee's scope was to decide appropriate tasks and the priority and then to implement each of those tasks. In addition, the committee dealt with loan applications for sheep and apprenticeships, and answered questions about trading situations and farming business (Christensen 1957a).

The Agricultural Technical Committee for Greenland (Dan. *Det jordbrugsfaglige Udvalg for Grønland*), the committee in Denmark, consisted of experts for cultivation, gardening, livestock breeding, and forestry (from agricultural associations, smallholders' associations, the Heath Society [Dan. *Hedeslskabet*], and the Agricultural University [Dan. *Landbohøjskolen*]). The role of the Agricultural Technical Committee was to obtain proper grass seeds, seed corns, equipment and fertilizer. In addition, it implemented scientific research with suitable grass species and tree species. In other words, the Denmark committee was an advisory body for the Greenlandic committee.

A growing need to expand hay fields

Bitter experiences from significant losses in the 1948-49 seasons (Dan. tabsåret; "the loss year") aroused the awareness to stable animals during the winter. This necessitated farmers to make or expand their fenced-in fields (Dan. "hjemme mark") in order to secure winter fodder (cf. Christensen 1957b).[43]

By 1952, experiments more inclined to sheep farming began at the hayfields at Upernaviarsuk. After the relocation to Upernaviarsuk, the Research Station purchased two tractors as well as other pieces of cultivation equipment. The Station regularly had two agronomists, two tractor experts, and a forestry expert. These well-trained staff members made an effort to plow fields throughout the sheep farming district. As a result, many sheep farmers rented tractors and other equipment to till the ground inside the fences. Some sheep farmers bought their own tractors. It is only after this period that farmers began to buy machinery such as tractors for the

[43] The word *hjemme mark* literally means "home farm," that is, fields on a farmer's property.

operation of sheep farming and cultivation (Christiansen 1981:151). For example, in Igaliku, where the soil was dry in the summer, farmers laid out irrigation systems (Christensen 1957a:76).

Severe winter, 1956-57 season

Disastrous winters intermittently hit southern Greenland. The year 1956 marked the 50th year since Pastor Chemnitz initiated experimental sheep farming in Frederiksdal.[44]

The fall of 1956 was relatively mild and weather conditions were rather favourable for sheep farming. However, by mid-November there was a sudden change in weather. A cold rain fell, mingled with snow, before being followed by frost. Most of the land was covered by thick ice layers. Thawing temperatures did not follow right away, and ice layers remained for a long time. During the1956-1957 season, sheep farmers in Qassiarsuk lost 60 percent of the 7,007 sheep, and Igaliku farmers lost 65 percent of their 5,211 sheep (Christensen 1957b). The total number of sheep dropped from 23,000 in 1956 to 17,000 by the 1957 spring. Thus, a single cold spell reduced the sheep population by one third. At this time, KGH and the Agricultural Technical Committee took immediate relief action, and along with the financial support from the Provincial Council (Dan. *Landsråd*) and the Ministry of Greenland, a total of 150 tonnes of hay and 150 tonnes of sugar beet were shipped to sheep farmers throughout the farming district. As additional support, KGH loaned fodder to sheep farmers.

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[44] While the SPS annually throws an annual banquet in midsummer, this year's banquet was specially arranged as a jubilee party. During the party, many events took place, such as the first cattle show in Greenland, which brought a life to the party. (Christensen 1957a).

Intension of the Agricultural Technical Committee versus reality of sheep farming

The Agricultural Technical Committee estimated that one hectare of field was necessary to secure the winter supply for 100 ewes. According to their calculations, it was not impossible to expand the number of the entire flock to 600,000. The Committee also estimated that it would be necessary for one owner to keep more than 300 sheep in order to make a reasonable profit.

However, the estimation of the Agricultural Technical Committee did not properly reflect the actual situation of sheep farming in Greenland. At that time, farm size was problematic, but it seems that increasing the size of their farm was not what farmers wanted. In 1961, out of 172 sheep owners, 89 owners, amounting to 51.7 percent, had fewer than 50 sheep (Figure 6-3). Included in this group were 106 owners who had fewer than 100 sheep, which amounted to 61.6 percent of the entire sheep owners. The number of the sheep owners who kept more than 300 sheep were only 32, or 18.7 percent of the entire number. Thus, the majority of the sheep owners engaged in sheep farming as supplementary to their main form of production.

In the interior of the fjords was arable land; as such, relatively larger farms clustered in the inner fjords. Many sheep owners near the coasts of the fjords combined sheep husbandry with fishing and hunting (Kampp 1964:90).[45] In 1970, out of 151, 64 sheep owners, amounting to 42.4 percent, had fewer than 100 sheep (Figure 6-3). They were fishers/hunters who engaged in sheep farming as a sideline. In contrast, 41 owners had more than 300 sheep, with two owners having more than 1,000 sheep. Compared to nine years earlier, sheep

[45] The reason why I use sheep "owner", instead of sheep "farmer" is that they were not specialized in farming only (cf., the beginning of Chapter 5).

owners with fewer than 100 decreased by 42, while sheep farmers with more than 300 sheep increased by nine. These numbers show that small-type sheep owners (sheep farming as a sideline) declined because of harsh winters, but medium- and large-type sheep farmers in the inner fjords had been established well even after the disastrous 1966-67 winter. However, in 1978, eight years later, the flock size of sheep owners lowered in general. The number of sheep in the area reduced by half (Figure 6-4), and the number of sheep owners also declined from 151 to 84. The number of owners, who kept more than 300 sheep, between 100 and 300, and fewer than 100 sheep, were 25, 31, and 28 owners, respectively, in almost equal proportion, but no farmers kept more than 700 sheep. This means that recurring harsh winters discouraged sheep owners from continuing sheep farming, particularly for small-type owners. Even the surviving sheep farmers lowered their flock sizes below 300.

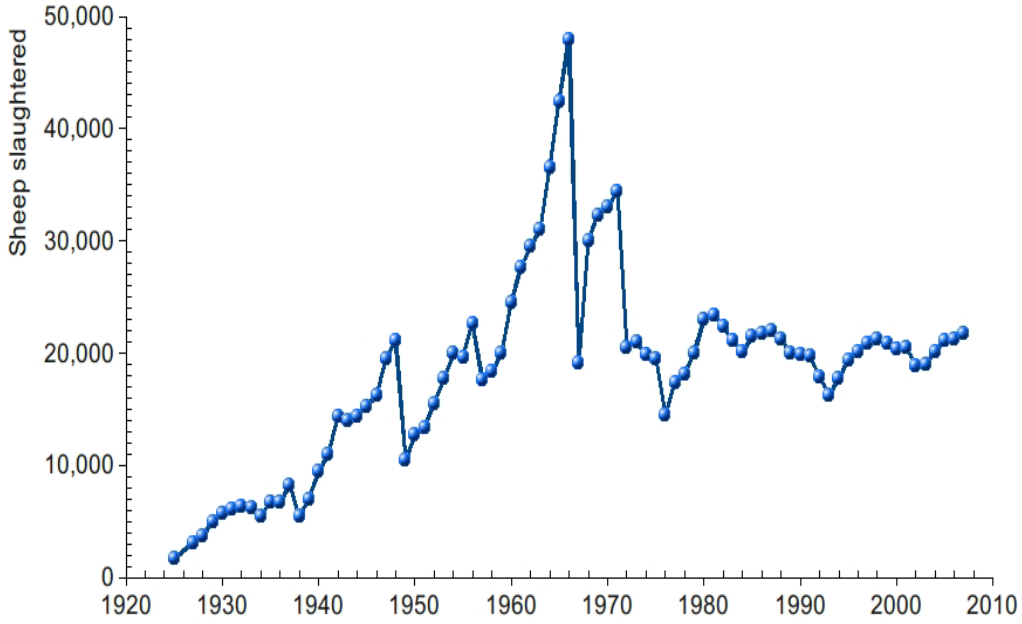

Figure 6-4. Number of sheep slaughtered between 1925 and 2007

Source: documents compiled by the Agricultural Advisory Office at Qaqortoq

An anecdote about smaller-scale, more diversified sheep farming in the 1960s

Recalling life in the 1960s, a man, who was born in 1951 and grew up in Narsaq, told me that animal husbandry back then was similar to Danish husbandry. In other words, farmers kept several kinds of livestock, such as cows, hogs, chickens, horses, and sheep. The main source of income was milk, pork, and eggs. His father was a dairy farmer in Narsaq. He milked the cows every morning before school, and after school, he walked around the town to sell his dairy products to the slaughterhouse and the fish-processing factory, and neighbors and doctors, selling his dairy products. Since the building of the fish-processing factory, the town had begun to draw many people and Narsaq grew rapidly.

It was not difficult to find helpers in those days, and it was cheaper back then to hire people. His father sent helpers to procure hay from small islands in the fjord as feed for cows and horses, but not for sheep. Although, cows, pigs, and chickens were stabled, sheep were let to graze outside throughout the year and occasionally provided fed in the winter. A small sheep shed limited the number of animals; therefore, the feeding routine was to rotate into the shed about 100 sheep at a time. He could not recall how many sheep his father had at that time.

Due to the nature of sheep farming in the past, it is difficult to provide a definite or confident approximation, of the number of sheep a farmer kept throughout any year. He remarked that his father may have had 500 sheep.

In 1964, he moved to Denmark to attend school. In 1975, he returned to Narsaq to discover that the farmers around the town had their cows and pigs slaughtered. Long-life milk and powder milk

were in the market, and locally produced milk could not compete with these imported products. This was also the case for pork and eggs. Denmark was exporting cheaper dairy products, and farmers gave up raising pigs and chickens. Interestingly, there were a dozen Faeroese and a few Danish sheep owners at that time. They kept sheep for their livelihood. Many sheep owners combined sheep husbandry with other occupations such as cattle and hog husbandry, egg production, fishing and hunting. Sheep farming was not limited to Greenlanders and was an occupation characterized by ethnic diversity.

Severe winter, 1966-67 season

The 1966-67 winters was the worst season in the history of sheep farming in Greenland. The number of sheep dramatically dropped from 47,000 to 22,000, losing 53 percent of the original population. At this time, there were approximately 175 sheep owners (Janus 1967). The majority of sheep owners engaged in sheep farming as a sideline, and only a few sheep owners had large flocks, but this was still a significant impact for many sheep farmers.

Many farmers and their families abandoned sheep farming at this time. This season's loss was so significant that a number of stories about it are retold to this day. Several sheep farmers, even those born after this season, told me the stories of the number of lost ewes. It was clear that this disaster occurred on sheep owners because they did not have enough fenced-in fields (home farms) to grow hay and grains and could not feed their animals during the wintertime.

Intensification of sheep farming

After repeated damage from several seasons of severe winters, the

Upernaviarsuk Research Station intensified the mode of sheep farming, as a means to adapt to Greenland's climate conditions. On the optimistic side was the aim to minimize potential damage during the winter season. On the critical side was the critique of undermining the diversification of Greenlanders' livelihoods (Berg 1972).

Key person 4: Kasper Olsen and the reform of the Upernaviarsuk Research Station

As outlined above, the survival of sheep and a sheep owner's business depended on whether or not winter fodder could be sufficiently secured, which could only be possible by the cultivation of home farms. The Research Station Upernaviarsuk was wading into making fields. As a result, tilled fields expanded from a total of 40 hectare in 1963 to 100 hectare in 1970 (Christiansen 1981:151). One of shortcomings, however, was the cost to transport cultivation equipment from one place to another (Kampp 1967:108).

However, it stopped abruptly in the end of 1971 due to a Finance Committee's decision. Presumably, the Committee intended to abolish the Station or significantly restrict its activities. In 1970, the SPS established a co-operative society (Dan. *andelsselskabet*) designed to finance the Station and to serve as its advisory body. The SPS' co-operative society, however, went bankrupt in 1975, and all of the Station's function stopped again.

Danish agronomists and veterinarians returned to Denmark, and 500 sheep were left at Upernaviarsuk. A person who made every effort to revitalize the Upernaviarsuk Station was young Kasper Olsen. He desperately went around gaining financial supports from Greenland's Provincial Council (Dan. *Landsråd*) and the Ministry of Greenland in Copenhagen and it worked out. Kasper studied at an

agricultural school in Denmark, and his father was a sheep farmer on the shore of Tunulliarfik Fjord. From his experience with his father and his agricultural education, Kasper was knowledgeable about sheep farming and the issues that Greenlandic sheep farmers faced in those days. Olsen was determined to promote sheep farming in Greenland. He was a key person for a series of campaigns to modernize sheep farming in the 1980s.

Due to negotiation between the Provincial Council and the South District's municipal authorities, the co-operative society was replaced by a self-independent institution "Upernaviarssuk," (with two "s"s in old orthography) and in 1976, all the buildings at Upernaviarsuk and the right to use related areas were transferred free of charge (Christiansen 1981:155). In the same year, the Agricultural Technical Committee for Greenland was abolished, but on the request of SPS a contact committee, as a successor, was established, and its role was to intervene when a problem arises that requires the involvement of the authorities and institutions in Denmark. With legislation in 1977-78, the state (95 percent) and the South District municipalities financed the running cost of the Station. As a result, the responsibility and initiative for the development of sheep farming in Greenland were transferred to Greenlanders' hands.

Severe winter, 1975-76 season

During the 1975-76 season, another cold snap hit the sheep farming district. The number of sheep dropped from 19,503 to 13,200. The responsibility for the series of damages laid perhaps with the Danish authorities who did not attach high priority to raising sheep owners' self-reliance, or perhaps with the sheep farmers who were too ambitious expanding their agricultural production (Høegh 1988:13).

After this harsh winter, a few sheep owners switched to an intensive form of sheep farming (Egede 1981:219). These sheep farmers demonstrated that stabling in the winter with nourishing fodder brought improvement to lambing performance.

Greenlanders' modernization campaign for sheep farming

By the middle of the 1960s, it seemed clear that the extensive sheep farming was not the viable mode of operation under Greenland's climate conditions. There was an acute need to reform the system to support sheep farming in southern Greenland and to improve farming practices based on a scientific ground. As a result, Greenlander Kasper Olsen and his few fellow officers in the new-born Upernaviarsuk Research Institute initiated a series of modernization campaigns. New endeavours in Greenland are more often initiated by a small number of people, foreign or Greenlandic, and include the introduction of foreign technology and knowledge.

Among others, urgent tasks were to build sheep sheds and to gain funds. Between 1976 and 1978, with legislations and SPS effort to obtain an understanding of funding agencies, the financial system regarding sheep farming improved. As a result, expanded financial aid became available for sheep farmers from the Business Support Committee (Dan. *Erhvervsstøtteudvalget*). Thus, the amount of funds that the Committee loaned increased from 0.3 million DKK in 1975 to 4.1 million DKK in 1979, out of which 2.7 million DKK were used to build sheep sheds (Egede 1981:219). Sheep sheds were self-building basis, with a capacity to shelter 300 to 500 sheep. Along with investments in buildings and machinery, the consumption (i.e., purchase) of fertilizer and concentrates more than doubled in the same period. Accordingly, sheep reproduction improved, such as 0.8 lamb

per ewe in 1975 to 1.2 in 1979. As a result, the mean flock size among sheep farmers increased from 170 sheep in 1978 to 280 sheep in 1982. This was made possible by Upernaviarsuk and its collaboration with the SPS and *Grønlandsk Teknisk Organisation* (Dan. GTO, Greenland Technical Organization).

A regulatory foundation from the autonomous government shored up the modernization campaigns. With the establishment of the Home Rule government in 1979, it passed an order concerning land allocation for sheep farming, as well as the Parliament of Greenland's by-law.[46] These regulations concern rules on property, the allocation of sheep farm and grazing rights on common grazing land, and rules on winter foddering, which require one hectare of land per 100 ewes, 40 kilograms of hay per ewe, and purchasing 60 fodder units of fodder per ewe. The government's order also requires sheep farmers to confine animals from November 1st to May 1st. In other words, the intensified mode of sheep farming became obligatory by law. As a result, sheep farming as a sideline became impossible, and sheep farming increasingly scaled up.

Co-operative research relationship with Iceland

The next issue Upernaviarsuk had to deal with was the expansion of cultivated land and the improvement of hay productivity. In order to feed stabled animals during the winter months, it was necessary to secure sufficient amount of hay and winter fodder during the summer.

In 1975, the Upernaviarsuk Research Station approached the Agricultural Research Institute in Reykjavik regarding its interest in a

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[46] The former is the Order of the Ministry of Greenland, No. 358 issued on July 27, 1979 (*Ministeriet for Grønlands bekendtgørelse nr. 358 af 27. juli 1979*) on land allocation for sheep farming (*Bekendtgørelse om arealtildeling til fåreavl i Grønland*), including ordinances of Greenland's Parliament on sheep farming (*landstingsvedtægt om fårehold*) as of August 24, 1979.

co-operative research project on the improvement of Greenland's sheep farming (Thorsteinsson et al. 1983). There were five reasons why Upernaviarsuk contacted Reykjavik. First, Iceland has historically been dependent for agriculture on sheep farming and this has required extensive exploitation of pasture vegetation since its settlement (*landnám*) era. Second, most of the sheep populations in southern Greenland are of Icelandic origin. Third, there are many similarities in climate and flora between the two countries, such as the growing season in both countries is short, the average temperature in the growing season is low, and the temperature fluctuates widely. Moreover, Iceland's Agricultural Research Institute accumulated 25 years of experience mapping domestic vegetation in order to make better use of the quality and capacity of pastures. Therefore, Upernaviarsuk needed technological assistance from Iceland in order to conduct vegetation research in southern Greenland.

Responding to Upernaviarsuk's request, representatives of the Reykjavik Agricultural Research Institute travelled to southern Greenland during the summer of 1976 and conducted a scoping field trip to mountain areas with Greenlandic and Danish officials. After obtaining a good picture of local problems and a sense of the areas in need of improvement Reykjavik laid out a five-year research project in fall of the same year. Their aim was to determine the best possible use of land for sheep farming in Greenland, in particular to measure the grazing capacity of southern Greenland and to explore potential areas for hay production. The research project's timeframe was from 1977 to 1981.

This project identified and classified cultivable areas. In addition, it determined grazing capacity of natural vegetation in southern Greenland (Egede et al. 1982; Thorsteinsson et al. 1983). This helped to provide a broad guideline to identify potential cultivable

areas during the following modernization campaign. The vegetation-mapping project laid the scientific foundation for a modernization campaign for sheep farming. Furthermore, to enhance hay production at discarded grass ranges, tests were conducted on some introduced grass species and the application of fertilizers (Thorsteinsson et al. 1983). In addition, an investigation was conducted on the nutritional requirement of sheep for healthy reproduction.

This research project was primarily funded by the Commission for Scientific Research in Greenland (Dan. *Kommissionen for Videnskabelige Undersøgelser i Grønland*) and Administration of Greenland (Dan. *Landsrået*); and after the creation of Home Rule government in 1979, by Greenland's Parliament (Dan. *Landstyret*) and three municipalities in south Greenland, i.e., Narsaq, Qaqortoq, and Nanortalik (Thorsteinsson et al. 1983). What was important now was that this modernization campaign was implemented with the then European Economic Community (EEC)'s agricultural fund as per the Council Regulation, which was derived from the membership of EEC.[47]

The Detailed Plan set in motion from 1982

At the first set out, fieldwork took place during the summer of 1981 in preparation for laying out the Detailed Plan (Egede et al. 1982) – known and remembered among the people concerned – for the next ten years' modernization campaign. Researchers visited and accessed each area identified as having the potential for cultivation according to the previous vegetation research project. Areas judged as unfit were discarded, and arable areas for hay grasses were surveyed in detail. Scholars from the Finnish Agricultural Technical Institute and Danish

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[47] Council Regulation (EEC) No 1821/80 of 24 June 1980 on the development of sheep farming in Greenland)

National Museum participated in fieldwork as technical advisers for cultivation and for the preservation of Norse archeological sites (Egede et al. 1982).

Based on the Detailed Plan, Development Project for Sheep Farming (Dan. *Udviklingsprojekt for Fåreavl*; Gl. *Savaateqarnerup Annertusarneqarnerani Pilersaarut*, hereafter SAP) was scheduled to begin in 1982 and end in 1991. In order to implement the Detailed Plan, the SAP office (Dan. *Konsulenttjenesten for Fåreavl*) was created in Upernaviarsuk. This office is viewed as the forerunner of today's Agricultural Advisory Office.

The task of the SAP office was to promote the Detailed Plan through technical and economic support for the cultivation of new fields and for the expansion of existing fields. Following the previous station's machine stock, the SAP office also had a large stock of machines, such as a couple of tractors, diggers, and different agricultural machines, to assist the creation of fields. Two machine teams moved around from farm to farm, transporting agricultural equipment and assisting in the cultivation of land.

The plan was rather ambitious, aiming to increase the sheep stock from 24,000 at that time to 43,000 animals (Egede 1982a). However, at this point, the Detailed Plan mainly focused on the creation of new fields in undeveloped land, and paid less attention to the existing farms, including farms with great potential for expansion.

Besides the creation of fields, the SAP office also worked on the creation and the extension of quays and roads to nearby sheep farms (Egede 1982a). For this point, the SAP office particularly paid attention to the improvement of the existing tractor roads in Qassiarsuk and road construction in the Vatnahverfi area (Egede 1982a). This aimed to provide better transportation and communication between farmers who resided in remote places and to

promote co-operative use of machinery between scattered sheep farmers (Rasmussen 2006). Other objectives included the expansion of slaughter capacity and of advisory services (Egede 1981:219).

The Revised Detailed Plan, 1985

In 1985, the project was reviewed and revised based on three years of implementation of the development project. It was found that the scale of existing sheep farms was too low to maintain a stable farming business in terms of the size of their hay fields and the number of animals they had. As a result, the development project included not only the creation of new farms in unsettled areas, but also an improvement and strengthening of existing farms (Egede 1985).

The Revised Detailed Plan goes so far as to state that farms without the possibility of improvement should be phased out, and that, if farm owners wished, they should be relocated to arable land. In addition, it states that sheep farmers should have 1.5-2.0 hectares per 100 ewes (Egede 1985:1). The final report of the vegetation mapping study published the following year recommends that in order to make a profit, a sheep farmer should have 350 ewes at least and six hectares of fenced-in fields (Thorsteinsson 1983:11). Perhaps, 400 ewes or more are needed to support a family (Rasmussen 2006:11). Confinement during the winter, increased amount of winter fodder, better quality of concentrates, and the introduction of new breeding techniques all contributed to the increased productivity of ewes. While nutritional care of sheep improved, the number of sheep (ewes) decreased from some 40,000 to 20,000; however, now farmers could obtain the same amount of lambs as in the 1960s with half the stock size.

Halt of the modernization campaign

Following a consultative referendum in 1982, the Greenland Home Rule government left the European Community (EC) in 1985. As a result, financial support from EC was no longer available, halting the Detailed Plan halfway. Although the development project of the 1980s was frustrated, the area of fields did increase through the efforts of individual farmers, from 235.4 hectares in 1982 to approximately 1,000 hectares in 2008. The number of farms decreased from 95 in 1982 to 48 in 2008, and at the same time that sheep farming became a viable primary occupation.

Concluding remarks: from exogenous to endogenous development

In theory, endogenous development is a process at a certain locale, in which the community members create a new tradition based on the existing traditions and incorporating foreign knowledge, technologies, and institutions in a way that properly fits into the locale's relationship to the environment on which they depend. By community, Tsurumi (1989:53, 1996:22-26) means a space where permanent dwellers can share common values and visions with them and can enjoy interactions with people from the outside.

Promoters of endogenous development are individuals with a spirit of independence and self-reliance. Tsurumi (1989:51, 1996:212-215) terms them key persons. According to her, they spontaneously take on a role to initiate and lead a process of bettering a way of life in order to reduce hindrances that arise when people of the locality want to explore future possibilities and to gain spiritual fulfillment. What is important here is the stimuli of outsiders, who migrate to or

temporarily stay in the community. Information, values, technologies, and thoughts they bring in to the community may redefine community members' common values and visions. These may also inspire key persons to envision an alternative, better way of life and to engage in the transformation of society.

In my review of a history of sheep farming in Greenland, I included outsiders as key persons although Tsurumi assumes decision makers and key persons are to appear within the community. As is often the case with colonial states, the first people who obtained an idea of introducing something new were outsiders. In this case, those with the idea of introducing sheep farming to Greenland were Danes, probably from the Board of Greenland, and many key persons in the incipient stage were not Greenlanders. Although I introduced four key persons, there could have been other key persons outside my historical review. Jens Chemnitz grew up in a remote settlement in southern Greenland, and he was keen to the betterment of Greenlanders lives. So was Kasper Olsen. Walsøe was a Dane and came to Greenland probably out of enterprise, ambition to begin a new endeavour, and a quest for a new life. Yet, he devoted himself to the promotion of sheep farming in southern Greenland. In his volume, Abel Kristiansen (1998: 27; 89&91), who was an apprentice under Walsøe, states how his commitment and eagerness to farming endeared him to many Greenlandic sheep farmers. Otto Frederiksen was the first Greenlander who had an innovative view to make an epoch in Greenlanders' livelihood.

The creation of a tradition begins from a locale with a community. In the Greenlandic sheep farming case, a community consists of people who base their livelihood on sheep farming in a larger area of southern Greenland, not a specific settlement such as Qassiarsuk and Igaliku. Tsurumi deals with a community pursuing endogenous development;

however, to my understanding, her perspective is directed towards individuals because without self-reliant individuals, endogenous development never begins. In effect, I have described in Chapter 4 that self-reliance is what it takes to become a sheep farmer.

Moreover, the review shows the importance of input from the outside world. In this respect, the networking with Denmark and other Nordic countries, although a product of a colonial regime, worked out to take in new knowledge, technology, institutions, and human resources to promote sheep farming. Therefore, with the introduction of sheep farming, Greenlanders obtained a tool for exploring future possibilities and envisioning future prospects.

Finally, I should make one more point in terms of the vulnerability of sheep farmers of the past and the present. This historical review of sheep farming clarifies that sheep farming was intensified by Upernaviarsuk in a response to the severe winters that repeatedly hit southern Greenland. On one hand, regulations, organizations and institutions were organized, sheep farming became robust; and the sizes of sheep farms were increased. They also successfully overcame the vulnerability to the coldness during the winter. On the other hand, one of the shortcomings may be that sheep farming lost a possibility to contribute to the diversification of Greenlanders' occupations. The primary purpose of introducing sheep farming was to offer a sideline for hunters. Now that sheep farming is regulated financially and statutorily, sheep farming is not open to anyone except full-time sheep farmers. Sheep farmers can engage in cod fishing in their leisure time, if they have the spare time, but not vice versa. Farmers in Igaliku have traditionally engaged in small-scale cod fishing, and there is a tendency for retired sheep farmers to spare time for fishing. In a sense, hunters and fishers lost one option to develop a sideline which would have been highly significant

economically and socially in the context of today's political, economic, and environmental changes (as for the coping of hunters and fishers, see Chapter 9).

Today's sheep farmers are highly dependent on government subsidies and global economy, as a result of streamlining the structure of sheep farming industry. This has created new elements of vulnerabilities of sheep farming in Greenland.

Sheep farming took hold in southern Greenland as tradition during the 20th century. Probably more key persons other than the ones discussed in this chapter devoted themselves to making a breakthrough under the existing conditions. Whether sheep farming will develop in the future depends on whether farmers can cultivate the sociocultural soil, which produces key persons from their community, who are inspired to undertake the role to solve problems, reduce suffering, and tackle difficulties inherent in society and who innovatively take in foreign knowledge and technologies to create a better way of life.

Box 6-1: Animal husbandry between the 18th and 19th Centuries

The Hope's Isle, which Hans Egede's made home (1721-1728), was situated near the outer sea and was not a good place for animal husbandry. As he thought, Egede could have obtained enough hay for the animals on the shoreline of Præstefjorden, further back of the fjord and just south of today's Nuuk (Gulløv and Kapel 1971). In fact, some sheep farms were established there in the 20th Century. Egede did not, or could not, set up a stock farm at Præstefjorden, probably because of a lack of funds. Egede's trial of animal husbandry was not successful, but since then, it has become the missionaries' custom to raise an animal stock and grow vegetables in the church garden (Chapter 5).

For two years from 1765, Icelandic priest and missionary Egil Thorhallesen visited fjords around Nuuk and conducted surveys for the trade company to see if it was possible for Icelandic farmers to settle. He concluded migration was possible since the land was good enough to carry out cattle and sheep farming; however, the trade company shelved the plan (Egede 1982b).

As noted in Chapter 5, Anders Olsen initiated sheep farming in Igaliku in the latter part of the 18th century. In those days, only a handful of missionaries and colonial administrators kept animals as a sideline. Olsen's trial of sheep farming was unique compared to the other animal keepers because their interest in animal husbandry was focused on goats and cows, not sheep, but it is known that missionary Myhlenphort in Frederikshåb (Paamiut) kept sheep with young Norwegian caretakers (Kristiansen 1998:17). His purpose was to train Greenlanders for animal husbandry as a sideline, but it turned

out that Greenlanders showed little interest in sheep farming as their main mode of production was hunting. When he left Frederikshåb, he had to reduce the number of sheep, though there remained 21 sheep in 1773. The missionary had sold much wool to the then trading company.

Missionary Jensen's wife recorded another example of sheep farming at Narsaq in 1849. She wrote that then Colony Administrator Assistant Hans Raun kept many sheep as well as cattle including six cows and several calves. However, according to Raun's great grandson Pastor Gerhardt Egede's (1892-1969) reminiscence, sheep were not kept any more in his childhood while cattle were still kept in town (presumably in the beginning of 20th Century). Gerhardt remembered he played with a spinning wheel in his childhood, which belonged to his grandmother Marianne, and it was clear that wool was produced many years before (Kristiansen 1998:17). Despite this, wool production did not seem to go well at that time. Once, Denmark imported Greenlandic wool on a trial basis, but it was too stiff and did not attract Dane's interests (Petersen 1991:94).

Interest of residents in Greenland and Greenlanders at that time lay in the supply of milk. Accordingly, people directed their attention towards cows and goats, not towards sheep. Then, around 1850, Colony Administrator of Julianehåb Hinrich Rink estimated that the number of domestic animals kept by missionaries and Greenlanders were 30-40 cattle, about 100 goats, and approximately 20 sheep. The first lieutenant, Daniel Bruun, visited a trading post Narsaq during an archaeological expedition around 1890s, and wrote that there were nine cows in Narsaq at that time, each of which provided 11-12 pots of milk every day (Egede 1982b). In any case, sheep almost disappeared from Greenland. Even in Igaliku, sheep farming ceased in the middle of the 19th Century for unknown reasons, while cattle husbandry

continued. An interesting example is that former Colony Administrator of Julianehåb J. Mathiesen, wrote in his few of articles in the middle of the 19th Century encouragement to the Icelandic and Norwegian farmers to start sheep farming in Greenland on almost the same ground as previously used, but nothing came of it (Egede 1982b). People's interest in sheep-raising was not boosted until the beginning of the 20th century when the Danish authority intervened.

Incidentally, as sheep were (re)introduced into Greenland, cattle-raising slowly ceased. Presumably, it was easier to keep sheep than cattle because the latter require more winter fodder than the former. According to the above-mentioned Bruun's note from Narsaq, each cow required two fully loaded *umiaq*s (Gl. wife's boat) of hay during the winter (Egede 1982b). In earlier days, when there were no tractors, the making of hay required much physical labour. For example, in Igaliku, in order to dry grasses, they put some portion of grass clippings on the main fields of Igaliku and placed others on various parts of the shorelines of the fjords (Bak 1983:22). Then, they had to carry an amount of hay equivalent to 50 full-loaded *umiaq*s. In a bad harvest year, they made winter fodder from turnips (*ruuat*) and even dried fish (Gl. *ammassat*, capeline; Gl. *uugaq*, Greenland cod) in addition to hay. Considering this, it might have been difficult to keep cattle that require more hay than sheep. Consequently, cattle husbandry ceased in Igaliku in 1968, and by the 1970s, cattle disappeared from southern Greenland. It is interesting to think that cattle-raising has started to be discussed again in the course of global climate change. During my stay in Qaqortoq, the Upernaviarsuk Research Station was experimenting with cattle-raising with a view to reintroducing these animals to south Greenland.

7. Settling and Cultivating the Southern Greenland Landscape: the Sheep Farmer as Settler/Pioneer

Introduction: why do they live in isolated places?

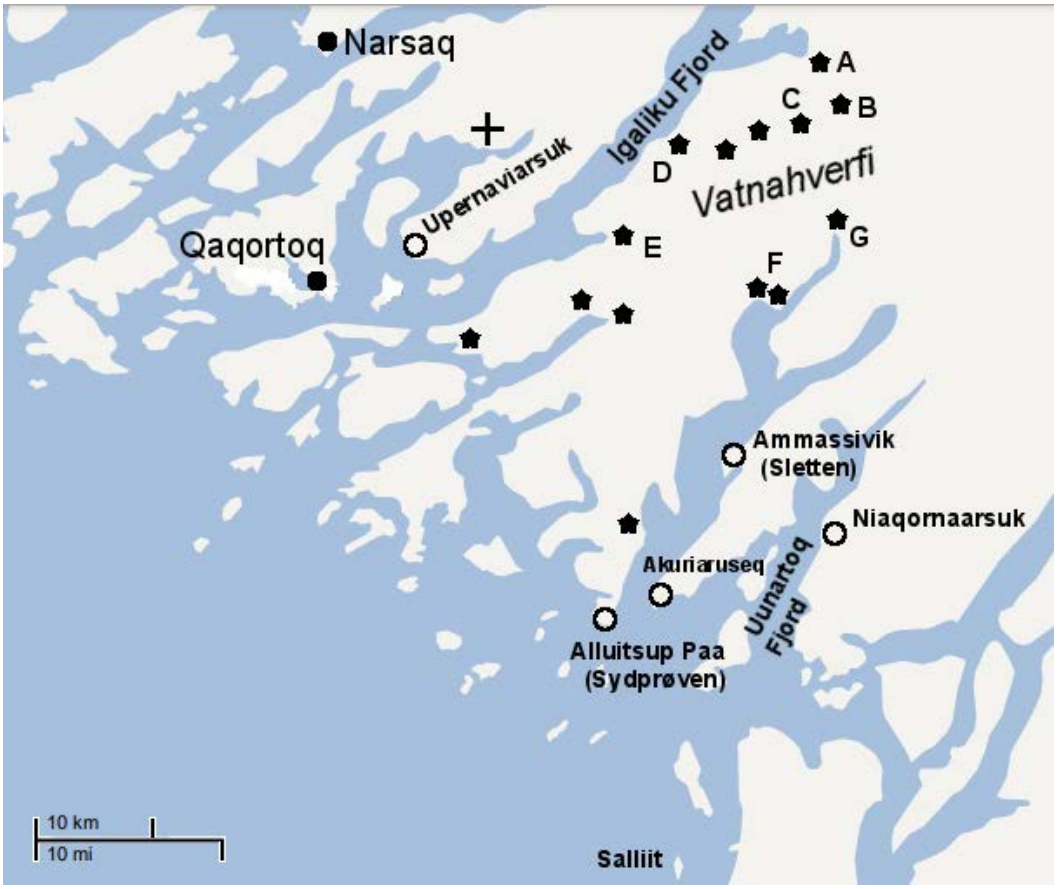
In the previous chapter, focusing on the appearance of key persons, I discussed the historical process; that sheep farming was actually brought in from the outside world but gradually took hold in the sociocultural soil of Greenland. My heavy emphasis on history and historical figures was necessary to provide a greater depth to understanding how the tradition of sheep farming developed and how people envisioned the future of sheep farming.

In this chapter, I consider the lives of people who are not considered or recognized as key persons in the development of sheep farming, but nonetheless, are actors who have received the developing tradition and have sought to carve their paths in the fjord landscape. Sheep farmers settle in isolated places with hopes and ambitions, dwell there, and develop a distinct identity as sheep farmers.

Sheep farming is a trying occupation, requiring farmers to be industrious, tough, and self-reliant. Some farmers fail to build their lives as farmers, but others succeed. There are many hardships awaiting them. Nevertheless, they try to be sheep farmers with their own values, traditions, and identities.

I will illustrate the lives of three sheep farmers, their ambition, their frustrations, and related historical facts. I intend to capture why and how sheep farmers settled in isolated, wild places and the "Inuit values" that allow them to hold their visions of the future.

I reiterate the difference between a settlement and a sheep farm (in an isolated place) in Table 4-1. Qassiarsuk and Igaliku are the only places where sheep farmers live together in the form of "settlements," while the rest of the sheep farmers dispersed along the shorelines of the fjords. They do not form a "geographical" aggregate like Qassiarsuk and Igaliku.[48]



Map 7-1 Sheep farms around Vatnahverfi and settlements to the south

Each star represents a location of a sheep farm. Star A, Igaliku kujalleq; B, Qorlortukasik; C, Timerliit; D, Qanisartuut; E, Eqaluit akia; F, Qallimiut; G, Qorlortorsuaq. A cross represents Hvalsey church (a Norse ruin).

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[48] There are some places where a few sheep farms neighbour, such as Qallimiut, but it is not appropriate to say that they create a community (cf., Map 7-1). In my view, a community is comprised of a bunch of people with enough human resources to start an endeavour.

By choosing to live in such isolated places, the farmers normally spend life away from human communities and forgo the relationships enjoyed in towns or settlements on an everyday basis. Making their home in isolated places means they have to carve out a life on their own by cultivating land and livelihoods under environmental conditions that are sometimes harsh and unforgiving.

To discuss life in a settlement, I have used the words community and settlement interchangeably in Chapter 4, but only in that chapter. When I discuss endogenous development in the later chapters, I regard a community as a group of all inhabitants in southern Greenland who undertake sheep farming. As such, community is a larger area of southern Greenland from a broad perspective, not a specific settlement such as Qassiarsuk and Igaliku.

Those who are the focus in this chapter make a minority group whose population accounts for only 0.3 percent of the total population of Greenland.

Sheep farmers as settlers/pioneers

As seen in the previous chapter, once sheep farming was introduced to southern Greenland as a result of a Danish initiative, many Greenlanders in the area took an interest in it. Sheep farming as a sideline business, spread in a short time throughout southern Greenland from Isafjord to Tasermiut (Ketils Fjord). The number of sheep owners (sheep keepers and farmers) reached 264 in the year of 1948 (Kristiansen 1998; cf. Figure 6-3).[49] Though some occupational sheep farmers, who herded hundreds of sheep, created the centres of

[49] By sheep keepers, I mean people with five to ten sheep besides their primarily occupations, such as fishing and hunting or something else. In contrast, people who conduct large-scale sheep farming are called sheep farmers (pl. *savaatillit*). Including both groups, I call them sheep owners.

sheep farming Qassiarsuk and Igaliku, the majority of early sheep owners were hunters and fishers, who had five to ten sheep (with or without sheep sheds), dispersing along the shorelines of the fjords and islands. Recurring harsh winters deterred unskilled or unfortunate sheep owners from continuing their occupation. In addition, the modernization campaign started in the late 1970s, decreasing small-scale sheep owners, and finally causing sheep farming as sideline business to vanish.

Table 7-1 shows the number of sheep slaughtered in 1965 and 1966. This time period can be called as a transitional period in scale from extensive to intensive sheep farming. Only two places, Qassiarsuk and Igaliku, accounted for about half the total number of sheep slaughtered in both years. When Igaliku kujalleq and Qallimiut were taken into consideration, these sheep farming centres covered approximately sixty percent of the total number of the slaughtered sheep. Needless to say, Qassiarsuk is the major and largest sheep farming centre in Greenland (Chapter 6). Igaliku, where the groundwork for animal husbandry was done during the era of Anders Olsen, became another big centre of sheep farming (Chapter 5). Soon after large-scale sheep farming was initiated, Qassiarsuk and Igaliku ran out of unoccupied space. Igaliku kujalleq was founded by a member of an Igaliku family in the 1930s, and so were Qallimiut and Qorlortorsuaq (shown in Table 7-1).[50] What I hope to relate from this table is that sheep farms do not exist perpetually. There are several places in the table that are no longer settled. It shows there was a rise and fall of settlements and farms during the past. In the following sections, I will discuss how this happened.

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[50] Qorlortorsuq was established in 1974. The owner of this sheep farm was the first Greenlandic sheep farmer who undertook a practicum in Iceland.

Table 7-1 The number of sheep (lambs and ewes) slaughtered between 1965 and 1966

	1965		1966	
Qassiarsuk	6,331	(221)	8,332	(354)
Igaliku	2,825	(72)	3,955	(137)
Igaliku kujalleq	808	(46)	1,271	(94)
Qallimiut	719	(26)	1,098	(112)
Tasiluk	497	(4)	1,048	(41)
Eqaluit	441	(10)	953	(21)
Narsaq	548	(53)	668	(18)
Qanisartuut	297	(19)	573	(48)
Eqaluit Iluat	270	(7)	565	(5)
Tasiusaq Saputit	327	(27)	536	(5)
Niaqornaarsuk	376	(28)	534	(31)
Kirkeruin	379	(28)	533	(54)
Illorsuit	376	(27)	519	(60)
Ipiutaq	234	(13)	467	(10)
Marrat	473	(6)	405	(1)
Lichtenau (Alluitsoq)	289	(10)	359	(14)
Qaqortoq	94	(12)	296	(32)
Qaarsutsiaq	236	(4)	263	(7)
Qunnermiut	307	(49)	254	(11)
Ammassivik (Sletten)	109	(7)	228	(7)
Illorpaat	148	(3)	170	(7)
Qassimiut & others	113	(31)	145	(57)
Narsarsuaq	121	(3)	143	(2)
Eqalugaarsuit	94	(1)	128	(1)
Narsarsuaaraq	113	(12)	121	(3)
Upernaviarsuk	102	(1)	113	(1)
Kangerluarsorujuk	2	(0)	93	(10)
Matup Tunua	94	(6)	89	(7)
Nanortalik	108	(19)	88	(12)
Ippik	62	(0)	86	(0)
Nuupiluk	29	(1)	69	(1)
Narsatsiaq	70	(3)	63	(5)

Continued to the next page

Table 7–1 Continued

Sydprøven (Alluitsup Paa	30	(0)	33	(1)
Akuliaruseq	83	(1)	19	(0?)
Total	17,105	(750)	24,217	(1,169)

NB. The numbers of ewes are shown in parentheses.
Source: Kristiansen 1998:84-85

What does it mean to settle in the landscape?

As Walsøe contemplated a century ago (i.e., in the 1920s), since large-scale sheep farming requires a vast spread of the land, a sheep farmer's family has to live at a place faraway from a town (Chapter 6). In other words, to become a sheep farmer means to become a pioneer in a wild or a settler on an abandoned farm. What does it mean to be a settler or a pioneer? It is an action to pursue a better life, or to explore possibility of the realization of the envisioned future. In this respect, a landscape he or she will settle in can be said as Sejersen's (2004) "visionscape."[51] He coins this term in that a specific social group of people will explore future possibilities in the landscape, through the engagement of which they gained knowledge, skills, and attachment in the past and the present. That is, the connotation of the term "visionscape" conveys the act of actually moving through, seeing, and dwelling in the landscape, providing a way to bring the past forward to the present and the future. Although he means that the landscape is one the people actively engage in on an everyday basis, I believe the word is also applicable to the landscape they never, or

[51] As Nuttall's (1992:54-58) coined-term "memoryscapes" tells, places with names convey people's mental images to them, such as affection, personality, and history. Place names give clues to negotiating the present and considering the future (Nuttall 2010). My emphasis here is less on the symbolic ordering based on naming than actors' immediate experiences of seeing and doing in the place that inform a way of their envisioning the future. In terms of the emphasis on a forward-looking perspective, I use the term "visionscape" in this context.

have seldom, used. This forward-looking intentionality inherent in this term presents the very nature of Greenlanders' settling and pioneering. For the land to settle in is not totally foreign to them. Even though they have not used, moved through, or dwelled there on an everyday basis, the landscape is more or less bound to them through actual visibility, some experiences gained nearby, and somebody's personal stories.

In this respect, the meaning of settling/pioneering in Greenland is very different from Americans' settling in and cultivating the "wilderness". According to Cronon (1995), the romanticized image of wilderness was created when the long period of American expansion came to an end in the late 19th century. Once Americans knew that there was no longer a clear line of frontier, they began to feel as if they lost something pure and free. A sentiment of the vanishing frontier evoked nostalgia for the frontier period, when a wild land was offered free, and men were real, fortitudinous, brave and adventurous. When urban dwellers thought of their lives based on industrial civilization as confining, false, and artificial, the frontier life looked freer, truer, and more natural. In other words, the frontier discourse is an antithesis to modernism, or to capitalism.

More problematic is that the term "wilderness" is liable to convey "empty," "virgin," and "pristine" – no hint of human presence in the word. Landscapes seemingly untouched by humans were actually modified by Native Americans. Native American use of fire is a good example for it (Pyne 1982). They burnt bushes and shrubs to make hunting easier, to harvest crops, and to prompt plant growth. In other words, American Natives were actively involved in the natural process of the ecosystem.

This kind of human intervention in faraway places is a totally alien concept to urbanites who actually do not live in the wild.

Consequently, this sense of place without substance tends to hide the reality. Interestingly, American "wilderness" corresponds with the Canadian North (Shields 1991:162-206). Southern urban Canadians, who account for two thirds of the population, associate the remote North in which they do not actually reside, with the era of explorers in 18th and 19th Centuries. For southerners, the North is the scene of humans wresting a living from an inhospitable, frozen, and harsh wilderness, and all the more, it signifies truth, purity, freedom, strength, and spirit.

For example, every time southerners plan a resource-based mega project, such as the installment of oil and gas pipelines, conflicts occur between companies and First Nations that would be affected by the project. This shows the depth of the gap between urbanites' understanding of the North and Aboriginal peoples' land use (cf. Caine and Krogman 2010). Both senses of place devoid of place were created by people who actually do not dwell in, do not move through, are not attached to, nor make their living from there. Moreover, Wallace and Shields (1997) discuss a culture peculiar to the post-industrial period of North America, in which people, money, lifestyle, and communities are swayed by a "placeless sense of place" which transcends the boundaries of cities and nations.

Unlike the American wilderness concept, the notion of a wild place in Greenland is a place to settle, and is neither empty nor foreign in terms that they form belonging and affection to it through activity in the place. Greenlanders live there as opposed to Americans and Canadians who do not live there. When Ottooraq Frederiksen considered starting sheep farming, the best possible option for him was Qassiarsuk because the place was within his "visionscape" and he was able to picture a new life there (see Chapter 6).

There is an episode of the founder of a farm in which he is

separated by the fjord from Tasiusaq, who was from Igaliku. According to what I heard, one day the man from Igaliku climbed a mountain nearby and, from there, saw the shorelines over the mountains of Qassiarsuk. Taking in this dramatic view he was inspired to settle in this place. Actually, that place is situated in the inner fjord, and probably he had an intuition that there were favourable climate conditions for farming.[52] Thus, Greenlanders' settling is an action that opens up possibilities for them within their lived landscape.

Nuttall (2010) discusses that hunters are also pioneers since they move from one hunting ground after another in anticipation of better opportunities and how hunting settlements have been created as a result of this process. Certainly, hunters and farmers move/settle into a new place with a view to achieve self-realization. However, I am quite reluctant to understand farmer's course of action on the basis of hunter's analogy.

While hunters exercise great mobility in their subsistence, farmers are sedentary, rooted in a place due to the nature of their occupation. Hunters may decide a place to hunt based on experiences of the past hunting grounds and on observation of the environment and animals. If the hunting ground he moved into turned out to be unproductive, he could move out to another place. On the other hand, the establishment of a farm entails a great deal of money and an enormous amount of effort. Consequently, farmers would not move unless a place to settle were surely promising. The place they would choose would include an old Norse farm, an abandoned Greenlander's farm, or a place the Agricultural Advisory Office recommends, although

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[52] Perhaps, this was the case for Norse Icelander Erik the Red. Although he settled the land foreign to him, his decision to colonize Greenland was based on his farming experience in his home Iceland and three years' survey and experimental stay in south Greenland.

farmers experiences and observations may inform their decisions. In this respect, a landscape interwoven with past relics provides a frame of reference to farmers (Chapter 5).

Problem setting: why people start sheep farming and what values they have

Settler farmers sometimes fail, for it is difficult for many to live in an isolated place. Towns and settlements are already far apart in Greenland. The fact that sheep farming requires a vast spread of the land pushes farmers further away from human habitations. Sailing through the fjords for miles and miles, sheep farms would seem to suddenly appear before one's eyes. The land is vast, surrounded by hills, mountains, the sea and sea ice, and at some places the inland ice sheet far away embroiders the backdrop.

Except for Qassiarsuk and Igaliku, there is no grocery store in the settlements, which is the vestige of an old colonial regime, KNI. When going shopping, it is necessary to go by boat to a nearby town or settlement. If a high wind blows, they have to wait, often for days, for the weather to improve. Very often I shuddered at the mere thought of having mechanical problems with the boat. Therefore, as I have previously discussed, the farming profession requires the farmers do everything on their own; namely, they are house builders, plumbers, electrician, and farmers. During my stay in Greenland, the famous American 1970s TV drama *Little House on the Prairie* was aired weekly. This explores family love, friendships, and many different themes through a family living on a farm in the American West of the 1870s. Some farmers' wives liked to watch this drama, although I personally felt that they did not need to watch it because their lives as such, are what the drama describes, namely a "Little House on the

Prairie Plus Big Ice."

A Danish businesswoman once told me that she could not understand how some Greenlanders could live in such a remote place and yet seem so happy. What makes them to choose a life of this kind? My answer to this question is seeking 1) better opportunities, 2) responsibility for all that relates to the self, and 3) an independent spirit derived from competency on the landscape; values that I will discuss in the conclusion of this chapter.

Why do some fail?

Let me begin to explore this theme with a question about why some sheep farmers fail. Returning to Table 7-1, I discuss the rise and fall of the fortunes and numbers of sheep farmers in the course of the development of sheep farming. After the years shown in the table, the number of sheep owners was on a downward trend. The winter of 1967-68 brought a significant reduction of the number of sheep to sheep owners throughout southern Greenland (see Figure 6-4). Eventually, small-scale sheep keepers disappeared. Even in the centres of sheep farming, such as Qassiarsuk and Igaliku kujalleq as seen above, some farms – once established – were repeatedly sold to different sheep farmers, while other farms were temporarily or permanently abandoned. The flow of the population caused a farming community to shrink and to expand. Some sheep keepers' communities totally disappeared by the outflow of population, such as at Akuriaruseq. Abandoned farms can be seen in many places in south Greenland. These include a farm on the shoreline opposite Qaqortoq, some farms on Eqaluit, and a farm on Narsarsuaq on

Uunartoq Fjord, to name but a few.[53]

The determination to live as a sheep farmer in isolated areas

Established farms do not always last forever. A time span of many farms could be only one generation to a few decades. This fact tells us that there are many factors that frustrate sheep farmers' business plans. By way of example, I was introduced to a farm at Ipiutaq on the northern side of Tunulliarfik Fjord, where a young married couple had just settled in and were busy preparing for the start of their sheep farming and tourist home during my stay in Greenland. As far as I know, ownership of the farm changed four times before they occupied it. I had heard there were some financial or psychological problems experienced by the previous owners. Generally speaking, reasons why a farm is closed down include the following: some sheep farmers are not good at book-keeping; some have family members with psychological problems; or because their sons did not want to become farmers or were simply not competent in farming work.

Difficulties besetting sheep farming are not only farming chores, but also living conditions in a remote place. Among others, the issues I heard about most frequently were the ones concerning wives. Many sheep farmers were sons of sheep farmers. They grew up looking at their parents' business from their early childhood. It was insinuated that they would succeed in their parents' businesses and naturally wanted to become sheep farmers. Accordingly, sheep farmers (husbands) have a reason to live in a remote place, but sheep farmers' wives do not. I have heard that there were some wives who had psychological problems because they did not like an isolated life, and

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[53] Narsarsuaq literally means a big plain. This place is different from the one with the international airport under the same name. This place finds a famous Norse nunnery ruin.

consequently left their husbands and children. For even Greenlanders who know that a life in a wild, remote settlement is part of their tradition, it can be difficult to live such a life.

Aina, who appeared in Chapter 4, was originally a town girl and there are other wives who came from town. They must have been determined to be sheep farmers' wives. It is almost impossible for a sheep farmer to continue sheep farming without a wife and it is important for those wives to be determined.

There are stories that tell how remote farms are to Greenlanders. Previously, prisoners were sent to sheep farms to help. This was intended to rehabilitate prisoners by making them work hard in isolated areas. Some students are still sent to sheep farms from vocational schools to gain work experience (Dan. *praktik*) for several weeks, which is part of vocational school's curriculum. An isolated place is seen as a place to train oneself.

The vicissitudes of farming life: crushed ambitions

Whether or not a sheep farmer can be successful depends not only on family problems but also on matters outside the family, such as a lack of financial and organizational supports from government. This section describes various factors affecting a sheep farmer's life by portraying the experience of Angut, a man who was once a sheep farmer in the greater Qassiarsuk area and now works for the government.

The earliest days of sheep farming in Qassiarsuk

I begin Angut's episodes by providing some historical context at the time of his father, who was one of Ottooraq Frederiksen's sons (see Chapter 6). Ottooraq, who settled in Qassiarsuk in 1924, had four

sons and two daughters. All the sons became sheep farmers, and both daughters married sheep farmers, bringing with them sheep as dowries. This contributed to the expansion of the Qassiarsuk area and the increase of sheep in the area. The first step to the expansion of the Qassiarsuk area was made by Ottooraq's first daughter and her husband. They established a farm on the shoreline midway between Qassiarsuk and the bottom of the Tunulliarfik Fjord around 1932. Two sons from this first "outpost" of Qassiarsuk each founded farms on the shore opposite Qassiarsuk across the fjord, just north of Narsarsuaq, and one of them is Annannguit, wherein Angut would later work (see Map 4-1). Another daughter's husband was a sheep farmer at Qassiarsuk. The first son (Pal's father and Kay's grandfather, see Chapter 4) was a founder of Tasiusaq around 1940, with the third son starting his farm at Qassiarsuk in 1945. The youngest son also started at Qassiarsuk, and the second son (Angut's father) was the founder of a farm at the bottom of Tunulliarfik Fjord in 1946. Incidentally, Tasiusaq, which appeared in Chapter 4, was founded in order to watch out for sheep and to prevent them from being trapped by *qaanngoq* (Dan. *isfod*; literally meaning "ice foot," a thick ice shelf formed along the rocky coastlines due to ebb and flow in the wintertime).

Sheep like to eat seaweeds to make up for salt shortage. They can go down the ice foot to the sea at low tide, but they cannot climb back up when the tide comes in. Sheep often drowned. As I have heard a similar story from a retired sheep farmer at Alluitsoq, presumably this was one of the major problems among early sheep farmers. (As I stated in Chapter 6, sheep were not confined to sheep sheds during the winter months in those days. It was only around 1979-80 when the current sheep shed was built to accommodate all of the owned sheep in Tasiusaq.) In this way, the bottom of Tunulliarfik

Fjord, along both sides of the shorelines, were settled by sheep farmers related to Ottooraq. Furthermore, descendants of Ottooraq's family members settled outwardly from Qassiarsuk towards Narsaq along the shoreline of the fjord. Consequently, all but three of the farms surrounding Tunulliarfik Fjord, from Narsaq to Qassiarsuk down to Narsarsuaq, are currently run by Ottooraq's descendants. In a sense, most of the farms facing Tunulliarfik Fjord enjoy close kinship relationships.

In the initial stages of professional sheep farming, farmers were still figuring out how to carry out effectively the seasonal chores of sheep farming. In particular, rounding up the sheep was a major challenge. Looking back on those days, one sheep farmer, who was around 75 years old at the time of my interview, explained that there were times when farmers could not collect a single sheep from the hills and mountains, even though they spend all day trying. Having experienced the excellent teamwork of systematic round-ups as I have described in Chapter 4, I wondered why it was so difficult for them back then. He answered, "*Nutaajugami* (Because it was new [to us])!"

In those days, sheep farming was a new occupation for Greenlanders, who had traditionally been hunters and fishers. Accordingly, it was necessary for farmers to team up with neighbouring farmers to collect sheep from the hills and mountains. They made, roughly speaking, three groups covering an area from Qassiarsuk to the bottom of the fjord so that farmers in each group were able to work together for round-ups.[54] They had numerous meetings to discuss where to collect sheep, how to divide their workload, and herding routes. Sometimes, they decided who would go to the seemingly difficult round-up route by conducting a lottery. As a result of the continuing process of trial and error, the way sheep are collected by the

[54] Today they have more groups.

teams was gradually shaped. This grouping is the origin of the establishment of *peqatigiit* (Gl., local sheep farmers' associations).

To summarize so far, Ottooraq was successful in establishing and developing sheep farming with financial and organizational support by the then Sheep Breeding Station at Qaqortoq (see Chapter 6). The expansion of sheep farming was made possible with kinship connections and the ways of sheep farming tasks, including rounding-up, were gradually shaped by networking farmers throughout the area. In sheep farming in Greenland, mutual support based on kinship seems very important for making a go of their business.

Angut's ambitions and frustrations

When Ottooraq's first and third sons began sheep farming, they received 300 sheep and 100 sheep, respectively, from their father. For some reason, Angut's father received only 50 sheep from Ottooraq, and the third son complained about this inequality. I could not discover more about the reasons for this.

Angut was born in 1952 and grew up on his father's farm at the bottom of Tunulliarfik Fjord. It takes just fifteen minutes or so by car from there to Qassiarsuk, but during his youth he went to school on horseback. At a remote place like his sheep farm, there was no health care service, which is still the case today, more or less. When he was 16, he fell off a horse and broke his leg. His sister's Danish boyfriend took him to Narsarsuaq by boat across the fjord. The following day, he was sent to a hospital in Qaqortoq by passenger ship. His injury was such that he was then sent to Nuuk by helicopter via Paamiut. He ended up staying in Nuuk for six months.

Around 1970, Angut went to an agricultural school in Denmark and worked on farms for both training and employment purposes.

After finishing school, he did a practicum at a farm in Iceland for one year between 1973 and 1974. Up until this point, a life course like his was regarded as the same every sheep farmer in the making would follow. However, he had another ambition.

In fall 1974, he flew to Alaska, where he worked on a musk-ox farm. He wanted to start musk-ox farming somewhere in Greenland and his employer at the musk-ox farm in Alaska was interested in his plan such that he later visited the Narsaq Commune. Angut returned to Greenland in the spring of 1976. His father's farm was succeeded by Angut's two older brothers. He was considering choosing Annannguit to start musk-ox farming. However, he could not muster the government's support for his plan and had no alternative but to go into sheep farming.

When he was starting out, the government loaned him money to buy the Annannguit farm from the founder. There was only one building at Annannguit when he settled in 1976. A sheep shed built by the previous farm owner had been crumpled by snow in the winter of 1968. This episode seems to be well known among sheep farmers, which is one of the stories to tell how much snowfall they had in that year.

At that time, building materials were available for free from Narsarsuaq. There were three abandoned wooden hospital buildings at Narsarsuaq, which were built by the U.S. military during the Korea War in the 1950s. Sheep farmers were able to freely fetch wooden boards as building materials from there, and without careful consideration they would build their sheep sheds.

Having only a house and a storm-battered sheep shed on the farm, Angut carefully built and added two sturdy barns, using building materials from Narsarsuaq. From a geographical point of view, Annannguit was not an easy place to do sheep farming. The

surrounding hills and mountains are much taller than those of Qassiarsuk, with an elevation of more than 900 metres. It takes three to four days to walk around a round-up route. On the other hand, the land of Qassiarsuk on the western side of the fjord, has, at best, an elevation of 400 metres. In addition, the herding area of Annannguit was much larger than Qassiarsuk. It became harder for Angut to walk up and down the long, steep hills and he eventually damaged his knees. Fortunately, he was able to take on a young helper through a program of *Mellemfolkeligt Samvirke* (Dan., an international aide association based in Copenhagen).[55] This man, a Greenlander with Danish heritage spent several summers working with Angut in the early1980s.

Lack of financial and organizational support for a new endeavour

I have stated in Chapter 9 on northern Greenland (Avanersuaq) that the Greenlandic government brought musk-oxen to Kangerlussuaq in 1986 in order to reintroduce the animals to Greenland after their extinction from there. The government later brought some fifteen musk-oxen from Kangerlussuaq to Ivittuut. The Ivittuut municipality expressed interested in Angut's earlier plan for musk-ox farming. But again, he could not get the Greenland government's support for this. Much later he heard from the then mayor of Ivittuut that he could have spared some 1.3 million DKK for Angut's plan. Angut told me that he thought the reason why he was thwarted in his attempt to start musk-ox farming was that the government's biologists, at that time, were strongly opposed to the release of a large herd of musk-oxen in the area.

For many complex reasons, both personal and economic, Angut

[55] See http://www.ms.dk, for further information.

left sheep farming in 1986 and he sold his farm to another brother. Angut then went to an agricultural school again in Denmark and returned to Greenland in 1990, when he started to work at Upernaviarsuk Station as a teacher. After that, he once again moved to Denmark for family reasons in the latter part of the 1990s and has worked for the Greenlandic government since 2002. Incidentally, after Angut's brother took over, work on the Annannguit farm halted again at some point. When Angut's brother put the farm up for sale, the above mentioned helper bought this farm and started to farm again in 2008.

Lessons to learn: a need for organizational support

First, this story shows sheep farms may repeat cessation and reopening at intervals of some years. Second, in order to keep animal husbandry businesses going, not only ambitions but also larger forces matter; in this case, financial and organizational support from the government. Third, the nature of the decision-making process in Greenland has been a top-down manner. Biologists have a say in land use and development. This is clear in living resource management, an example of which is the imposition of the quota system without the incorporation of hunters' voices in northern Greenland (Chapter 9).

Fourth, the administration in Greenland (today's Greenlandic government *Naalakkersuisut*; *Landsråd* before 1979) has not been good at supporting enterprise outside the existing business structure. Accordingly, Angut could not obtain support for his musk-ox farming project. This is still the case in reindeer herding. There are two reindeer herders in south Greenland. One is an Icelandic farmer who has a huge farmland at Isortoq, some 95 kilometres northwest of Qaqortoq. He has been engaged in reindeer herding, and its

contribution to Greenland's economy is not negligible, yet the government was not willing to offer support for his business in a favourable manner. As a result, as of 2009, he was considering stopping his business within the next ten years. The other is a Greenlandic fishing family at Narsaq. The operator and his son are primarily engaged in small-scale fishing, with less focus being placed on reindeer herding at Tuttutooq, an island across the sea from Narsaq. Their operation is rather extensive.

The Vatnahverfi area: rise and fall of sheep farms

There are seven sheep farms, as of 2009, in the Vatnahverfi area, three of which are old farms located near shorelines, such as Eqaluit Akia, Qanisartuut, and Igaliku kujalleq (Map 7-1).[56] On the other hand, four farms are located farther inland, and it was not possible to establish these farms without the modernization campaign based on the Detailed Plan in the 1980s. During this period, a road was carved from Qanisartuut to Igaliku kujalleq and vegetation research was conducted extensively with a help of the Iceland's Agricultural Research Institute. There was a concern about erosion if sheep were herded in this area, but the detailed investigation cleared this concern. Among approximately 50 sheep farms in south Greenland, no farm is found inland, except for this area and one in the valley north of Qassiarsuk. The rest of the sheep farms are all located near fjord

[56] One sheep farmer founded Eqaluit after he had lived in Igaliku kujalleq for a short time around 1940. Qanisartuut was settled by Ottooraq's granddaughter's family. Her husband learned how to build houses and ships and how to deal with seal blubber in Qaqortoq. In 1946, he moved to Ammasivik (Sletten), which was a settlement of fishers and sheep owners at that time (see Apollo's section). While he worked for, presumably, a colonialist's (KGH's) grocery store, he kept five sheep or so. Since Ottooraq advised him to focus on sheep farming, he settled in Qanisartuut with his family and founded his farm. Presumably, it was around 1980 that Eqaluit akia was settled.

coastlines. The main reason for this is that there is no road from the shoreline inland except for these two areas. In this respect, four farms in the inland enjoy developmental support of Greenland's government. On the other hand, Igaliku kujalleq has seen the rise and fall of sheep farms since its establishment. Contrasting the two inland farms with Igaliku kujalleq, I will discuss Greenlandic farmers' pioneering.

Timerliit: industrious dedication to sheep farming

Timerliit means the point of body far away from the outside or the deep inside of the body. It is located about seven kilometres inland from the quay of Qanisartuut. It is only fifteen minutes' drive from the quay to this place if the road is arranged, but when Saqu and his wife Aja settled in Timerliit, it took as long as nine hours to transport agricultural machines across quagmire since the road was not broken up. Saqu's and Aja's parents were both officers working at Upernaviarsuk.

Rooted in Igaliku

Saqu's father was originally from Igaliku, where he was a sheep farmer. People with Igaliku's origin are almost exclusively involved in sheep farming. Naturally, Saqu's grandfather was a sheep farmer there until 1970. Saqu's father started sheep farming just before 1967. Yet, two severe winters 1966-67 and 1971-72 frustrated his attempt to continue sheep farming because these occurred at a short interval so that he could not rebuild his economy.

Involved in the modernization campaign at Upernaviarsuk

While working at the settlement's only colonial grocery store (today's

Pilersuisoq, KNI) as a manager, Saqu's father was offered to work at Upernaviarsuk for the management of sheep and fields. At that time, Upernaviarsuk just started the vegetation research project with the following modernization campaign in their mind. In the course of the Development Project for Sheep Farming (SAP, see Chapter 6), the sheep farming school was established at Upernaviarsuk in 1984. Supervision of students' work was Saqu's father's task. Sometimes, he took students to sheep farms at different places in order for them to develop their judgement, so as to determine the potential land for sheep farming. Saqu's mother worked as a cook for the students. Presumably, Saqu's parents were the best possible workers at Upernaviarsuk, since, according to what I heard, young, unwed persons usually could not stand a life in a remote place like Upernaviarsuk.

Settling in Timerliit

Saqu was not imposed by his father's will, but he decided to become a sheep farmer. He studied at Upernaviarsuk in his first year, and then went over to Iceland to gain practical experience. After finishing school, he worked aboard a shrimp trawler to earn money to start sheep farming. He was also working for the Upernaviarsuk team that transported agricultural machines from farm to farm. Since Upernaviarsuk started to direct attention to the development of the inland area, such as Vatnahverfi, Saqu was naturally attracted by this area. At first, he had another place in his mind, but while walking across the land from Qanisartuut to Igaliku kujalleq, he decided to make his home in Timerliit. Only during the summer of 1988 did Saqu and Aja work to make fields at Timerliit. They slept in a tent and cooked with camp fire. He also bought a tractor during this period. The following year, they moved to Timerliit, completing their

house and fields. On New Year's Eve, a farmer who resided at Eqaluit akia at that time, who was Saqu's good friend, gave him one lamb and four ewes to celebrate the start of Saqu's sheep farming.

At that time, he did not have a sheep shed, so he kept the sheep in the basement of his house, feeding them with hay that he grew during the summer. Other than sheep, he kept in the basement five hens that his father had given him. In 1990, Saqu built a sheep shed and put approximately 400 sheep in it. The following year, his father and mother moved over to Timerliit from Upernaviarsuk. His brother helped Saqu to make fields during the summer of that year. In this way, Saqu gradually developed his farm. As of 2009, he had over 600 sheep, four cattle, 14 horses, four dogs, and 14 hens.

Saqu seemed to be reserved but had a progressive spirit, trying to increase as many options he could manage as possible. For example, he bought a pair of cattle in 1998, which were the first reintroduced cattle to southern Greenland since last cattle was slaughtered in 1972-73. In the summer of 1998, he flew to Iceland and learned how to breed and raise cattle. After that, he was fortunate to have calves. Also, Apollo, who will appear below, and Saqu built the first hydroelectric dam for personal use in this area (see Chapter 4). They are now able to reduce the use of oil to almost nothing because of this.

Lessons to learn: Dedication to sheep farming

Since 1984, there are always students at the sheep farming school at Upernaviarsuk. One may wonder if the land of south Greenland will be filled with sheep farmers because Upernaviarsuk produces sheep farmers every year; however, not every student can become a sheep farmer after Upernaviarsuk. Most of the students who can become sheep farmers are sheep farmers' sons and still all of them do not

become sheep farmers. There were some students who came from town in the past but few town students became sheep farmers after training at Upernaviarsuk. These students had to start their own farms from scratch, finding a place, buying sheep, and building fences and sheep sheds. In contrast, sheep farmers' sons already had some experience and knowledge from their childhood and could inherit a farm from their parents.

Although Saqu had been observing sheep farming since his youth, he was not the son of an active sheep farmer. Accordingly, he had to build his farm from scratch. Still he was determined to become a sheep farmer. Unlike Angut, he was able to enjoy organizational support from Upernaviarsuk, for the timing of the modernization campaign for sheep farming coincided the time when he wanted to become a sheep farmer.

Qorlortukasik: a young settler's spirit of independence

The Qorlortukasik farm is owned by two brothers, Joris and Apollo, but it is the younger brother Apollo and his wife Sisi who permanently farm in Qorlortukasik since the elder brother Joris is primarily a fisher. The brothers' father was also a sheep farmer.

Migration with sheep from one settlement to another

Let's trace a brief path through these sheep farmers' shared history. The brothers' father was born in 1922 at Salliit, an island placed between Alluitsup Paa and Nanortalik. The island is now uninhabited, but at that time, hunters based on the island earned a living by selling seal fat (Gl. *orsoq*). At some point, the family moved to Alluitsup Paa and further moved to Niaqornaarsuk in 1944, where

the father started sheep farming in 1957. The following year, Apollo's sister was born. Eight years later, Joris was born, being named after his grandfather who had worked for KGH and passed away just before Joris' birth. Apollo was born in 1967. Niaqornaarsuk was a small settlement, which is also uninhabited now, and when they were born, the mother was sent to a hospital in a nearby town. Apollo actually had another elder brother, but when the brother was 25 years old, he passed away because he fell into the sea and hit his head on a rock.

The 1966-67 winter, when Apollo was born, was a notoriously harsh winter. The number of their father's sheep was reduced from approximately 700 to 500. When children in the settlements reached school age, they were sent to a boarding school nearby for several years. The parents were disconsolate having their children away from them for such a period, and decided to move to Ammassivik (formally called Sletten), where a school was located.

During September and October of 1969, the family first moved to Ammassivik by boat, leaving the sheep behind at Niaqornaarsuk. Then, between January and February of the following winter, they herded approximately 450 sheep on the surface of the frozen fjord to Ammassivik. At that time, the shrimp was abundant off Ammassivik, and there were 15 to 20 fishers and sheep holders who kept approximately ten sheep each in the 1960s. Although the number of sheep owners was reduced in the 1970s, there still remained several sheep keepers (with several sheep each). It is said that, among them, there was a farmer who owned some 200 sheep.

Course of action influenced by warming climate

Apollo met Sisi at a gymnasium (high school) at Qaqortoq. Apollo was not a sheep farmer to begin with, as he and his brother, Joris, started to earn a living by fishing together in 1991. After the five years of his

fisher's life, Apollo decided to switch his occupation from fisher to sheep farmer. Responding to my question of why he decided to do so, he remarked, "*Saarullik tammarpoq.* (The cod was gone [from south Greenland])."

As we have seen in the previous chapter, a decline of the cod stock started in the 1970s owing to the cooling sea temperature and this environmental change determined the brothers' course of action. The elder brother, Joris, moved up north to work for a shrimp fishing company while the younger brother, Apollo, remained in the south to start sheep farming. Since then, Joris has been working for a shrimp fishing company in Sisimiut, using a 21-meter vessel that can hold six to seven people. The fishing season is divided into two periods between February and June and between September and December. During the off-season, he comes back to his homeland to help Apollo with the sheep farming.

In 1995, Apollo brought the sheep northerly to Igaliku kujalleq, where only one sheep farm was active at that time. This farm's owner was a good friend of Apollo, and he stabled Apollo's sheep for him. Apollo and his wife, Sisi, started to build a house on their own in Qorlortukasik, with the help of Joris and other friends and relatives. It was completed in November 1996. The day after they moved into the new house, the couple's first daughter was born. Now, the couple lives there with their three children. At the time, Apollo's sheep were still being stabled at Igaliku kujalleq. In September 1998, they started to build a sheep shed at Qorlortukasik, which was completed in 1999. The sheep shed is rather big compared to other sheep farmers', in which approximately 500 sheep are stabled during the winter.

Lessons to learn: reflecting on a history of sheep farming

This family's story reflects well on a history of the development of

sheep farming in south Greenland. The brothers' father combined cod fishing and sheep farming, but soon he became a large-scale sheep farmer with as many as 700 sheep. Due to extensive sheep farming, he reduced his sheep to 500. In addition, seeking for a better opportunity, the family moved from one settlement to another with their sheep. Then, Apollo finally became a professional sheep farmer due to a crash of the cod stocks in the 1970s. While for Angut, the government (i.e., larger political forces) determined his course of action, for Apollo and Joris, it was environmental change caused by climatic change, namely cod stocks and distribution.

Igaliku kujalleq

This place was previously called "Qassiarsuk." When Inspector H.J. Rink visited in the 1850s, he mistakenly believed that the Norse ruin at this place was the remnant of Gardar church (Bak 1981:41). Since it was inconvenient to have two places with the same name, this place was renamed "Igaliku kujalleq" in Greenlandic or "Søndre Igaliku" (often written as Sdr. Igaliku) in Danish.

Population dynamics in Igaliku kujalleq

As introduced in the beginning of this chapter, Igaliku kujalleq was once a centre of sheep farming in the same manner as Qassiarsuk. It is known that in 1937 the number of inhabitants at Igaliku kujalleq was 18, and levelled off for some time, then rose to 28 in 1960 (Bak 1981:93). In 1965 the population further increased to 38, with six sheep farming families, and the number of animals grew to 2,400 the following year. There was buoyant optimism among sheep farmers, which was not peculiar to Igaliku kujalleq, but to all through south

Greenland. Then, a harsh winter hit South Greenland in the 1966-67 season and expansion suddenly turned into stagnation. Another harsh winter came again in the 1971-72 season. Although sheep farmers were well prepared to cope with a severe winter by this time, the sudden population outflow occurred, which led to only one sheep farm being left. According to what I gathered, when the shrimp processing facilities were built at the settlement of Alluitsup Paa many inhabitants abandoned Igaliku kujalleq and relocated there. In 1976, a young sheep farmer moved in. It seems that there were only a couple of sheep farms during the 1980s and well into the 1990s. Sons of the families tried to succeed in the farms, but ended up in failure. When I visited in winter 2009, there was a young sheep farmer who just moved in to this place with some 200 sheep. There were several abandoned buildings dotting the wide open plain facing the fjord, with Norse ruins and the inscription of the place's founder Andreas Egede among them.

Lessons to learn: the rise and fall of communities as a result of people's intentionality

In the course of climate change, people switched their occupations. When cod fishing was at its zenith, people became fishers or worked at fish processing factories. When cod fishing collapsed, fishers shifted to seal hunters. Therefore, changed environmental conditions have caused demographic transitions among fishers, seal hunters, and sheep farmers in south Greenland. This is a result of people's intention to seek better opportunities. This is still the case today. From my interviews with fishers and hunters in Qaqortoq, there are some hunters who began to combine fishing with their livelihoods because there was a slight upward trend in the fish catch.

Values behind settling

So far, I have discussed that settling or pioneering is the Greenlanders' means of exploring possibilities in the landscapes in which they dwell and engage in sheep farming. At the same time, this is a strenuous endeavour. I will next discuss three values, and conclude this chapter with reference to Lynge's (1998) Inuit values.

Hope for future possibility

In Greenland, the rise and fall of communities were decisively dependent on government initiatives to establish or abandon communities. If the government shuts down a fish processing facility, the resulting loss of employment will cause a decline in the community. Similarly, if lifelines, such as the regular transportation services, are stopped, the community will decline in isolation. In this way, people are dependent on public material supply.

From a viewpoint of the sustainability of the community, abandoned or demolished communities were failures because they could not even resort to any support from the outside, nor could they diversify their economic strategy to maintain its inhabitants against external and internal change. However, looking at society from a lower point of view, it can be said that individuals' lives were certainly resilient by migrating out to a larger town or an uninhibited land, exploring a new business opportunity. Take Igaliku kujalleq as an example, after the severe 1971-72 winter, the community as such rapidly declined. Although settlements declined, this was the result of the people trying to seize future possibilities. By migrating to towns with fish processing plants, they wanted to realize the better life that they envisioned at that time. That is, leaving the previous land

and settling in a new place are the same thing, in that people are trying to have possibilities open up for them. One must be psychologically flexible enough to accomplish this, to utilize the best social relation based on kinship and friendship, and to find a new place that may offer a prospect for a new life.

Being ambitious enough to initiate musk-ox farming, Angut settled in Annannguit. Saqu and Aja settled in Timerliit with the hope of starting an inland sheep farm, which were rare in Greenland. And, young couple Apollo and Sisi, who were still in their mid-20s, settled in Qorlortukasik, shifting his primary occupation from fisher to sheep farmer and placing their hope in this new land.

Just as the ever-shifting Arctic environment, possibilities for the future come and go in a short time and are elusive. Greenlanders try not to fail to seize an opportunity. My image of this is a Greenlandic hunter judging which piece of sea ice is safer in one moment and jumping on it before the ice on which he was breaks. Their decision comes from knowledge and experience that are derived from moving through the space of their lives, activities, and livelihoods (cf. Bourdieu's [1977] habitus). When Greenlandic settlers migrate into a new place, they envision beginning new lives on the land. There is a hope for the future.

Responsibility for all they do

There is a sizable house at Timerliit that is used as an elementary school building. Since there are only sheep farmers who reside in the Vatnahverfi area, this school is exclusively for their children.

Bak (1981:41) states that a school chapel built at Igaliku kujalleq in 1967 was only used for one year because it was difficult to get teachers to come to this place. After that, six children at their school

were all sent to a boarding school at Igaliku. This coincides with the time when a harsh winter hit sheep farmers throughout southern Greenland.

It is still difficult to call in teachers to such an isolated place like the Vatnahverfi area. Sheep farmers' wives need to be their children's teachers. At an isolated place like a sheep farm and a hunting settlement only parents, if necessary, are allowed to teach their children at home and only for the first one to two school years. In addition, as I explain in Chapter 4, a person without a teacher's licence can teach at school if certified teachers are not available at such a place. Nevertheless, Aja and Sisi both went to the Teacher's College at Nuuk to become qualified as a teacher. They thought it would be better for their children. I add that wives who were teaching at Qassiarsuk's elementary school did the same thing. In any case, certified or not, they are still required to provide the same curriculum as the town's schools.

The sheep farmers' wives I met at Qassiarsuk and Vatnahverfi were strongly aware of the need for a good education for their children. Generally speaking, their husbands are outside all day doing farming chores, so that cooking, housekeeping, and particularly child-raising fall on the wives' shoulders. Living an isolated life, the children may have less stimulation and excitement than town pupils. They would only see their parents and neighbours a day. All the more, the wives feel responsibility for providing as good an education as they can. In effect, it is said that the performance of sheep farmers' children at school are as good as town's pupils or even better. Some sheep farmers' wives mentioned that they feel responsible for providing a good education to their children. Furthermore, they added that what shapes their lives at a remote place is a feeling of taking responsibility for every area of their lives. Certainly, farmers do everything they

need to live in an isolated place, such as building and repairing their facilities, fencing up, taking care of sheep, training horses and sheep dogs, tilling, rounding-up, and so forth. They know that all their performances, good or poor, will eventually come back to the doer.

Spirit of Independence/Competency on the landscape

In addition to the responsibility for their lives on land, I assume that the spirit of independence and competency on the land and the sea allows Greenlanders to feel their settled landscape as a place to dwell. The larger the scale of the sheep farm becomes, the more independent sheep farmers are required to be. Even though I describe farmers in Qassiarsuk exercising excellent teamwork for the round-up in the fall, I do not mean that they are mutually-dependent upon each other. Since it is not possible for one farmer to collect the sheep from the hills and mountains, a group of neighbouring farmers have to work together.

There are some farmers who share agricultural machines, and there are times when farmers borrow hay bales and concentrates (i.e., winter fodder) in a time of shortage. Yet, each farmer is rather individually engaged in his own business. Many farmers do not get involved in others' economic affairs. Most farmers own their own machines. Even though some farmers become stuck in financial problems, many farmers can think of nothing but their own businesses. This shows how hard it is to keep their farming business going. There are even some farmers who are reluctant to ask for a help probably because of emotional entanglements or pride. A sheep farmer needs to be financially, materialistically, and mentally independent.

It seemed to me that a spirit of independency derived from their competency on the land is widely appreciated by sheep farmers and it

is ascribed to the quintessence of sheep farming. This is also discernible in my interviews with hunters. Hunting is not a lucrative profession, compared to, let's say, tourism. In addition, hunting in the Arctic environment involves much uncertainty and danger, such as the precarious weather, life-threatening accidents, and injury. Still, quite a few people continue to become hunters. Some hunters said to me that they want to decide on their own and to live their lives by their own account. Some hunters mentioned that they think they are fit for hunting rather than working at an office from nine to five. In other words, this is a matter of choosing of a way of life, rather than working to make money.

Accordingly, what connects Greenlandic settlers with a life on land and sea is a desire to be self-sufficient on their land. Again, to put oneself in an ever-shifting Arctic environment means to be tested whether one is competent as a hunter or a farmer (cf. Nuttall 2010). In an Inuit tradition, it is important to be calm enough when confronted with an unexpected situation so that he or she can be competent to cope with the situation (Briggs 1991). That is, to be self-sufficient requires competency in their settled landscape. To live on their own, whether by sheep farming or by hunting, one would be required to exert maximum effort to survive in such a severe environment, and to be vigilant, and to be psychologically and physically flexible and bold.

Concluding remarks: (Greenlandic) Inuit Values of life

From the above discussion, I have derived three values that Greenlandic settlers have for life. I would like to add one more value: "to take care of nature (the land)." I did not raise this particular point with them but through numerous conversations with the farmers and

other Greenlanders, I learned they have it. Thus, the values I derived from Greenlandic settlers include: (i) willingness to open up new possibilities (ii) taking responsibility for everything that relates to their lives, (iii) spirit of independence, and (iv) competency on the landscape.

Interestingly, these values I have found actually coincide with the traditional Inuit values that Greenlandic Catholic priest Finn Lynge (1998:25) raises in his article in which he defends seal hunting against animal rights campaigns. According to him, the values on which hunting is based include:

1) *Tukkussuseq* – generosity and hospitality

2) *Akisussaassuseq* – responsibility towards the land and living things.

3) *Nunamut ataqqinninneq* – pride in knowledge about the surroundings

4) *Inuk nammineq* – personal independence and individual strength

During a discussion with Lynge, he expressed concern over the recent erosion of these Inuit values, represented in a lack of environmental responsibility due to the intrusion of the monetary economy and a materialistic lifestyle; however, he insisted that these values are invariable Greenlanders' principles for subsistence, life, and society. In other words, a tradition of sheep farming has been fostered by people with these values for life. In effect, Tsurumi (1989) argues that self-reliance and a spirit of independence are requirements for creatively looking for a better way of life, which will ultimately lead to endogenous development. Furthermore, I would say that the dynamics of farming communities and settlements in southern Greenland during the 20th Century reflected these values for life. When sheep owners migrated to a new place, they had a vision of

possibilities opening up for them in there. In their mind, they must have had a vision that was backed with their immediate experiences of their lives and activities ("taskscape"), through which skills and environmental knowledge would develop.

Finally I conclude this chapter with an interview of a retired sheep farmer, who was 71 years old at the time of my interview. When I asked him what are the important lessons needed to continue to be a sheep farmer, his answer was as follows:

> When he was 12, his father lost 90 percent of his sheep. [By this he meant the harsh winter in 1949.] His family had a hard time at that time. Nothing had ever been worse than this. Every time he was confronted with a bad event, he managed it by remembering that it was not as bad as that winter. In his youth, he was told to have endurance and to wake up with hope every morning. Endurance and hope are the best tools for a sheep farmer. The important things to remember as a sheep farmer are to take care of the land and to be able to be alone for a long time.

Then, his wife added:

> You have to be alert to everything you see and hear. Use everything to rebuild your life and yourself.

I believe these statements include all of Greenlanders' values for life, which I have explored in this chapter, such as responsibility, opening up to future possibilities, independence, care for nature, and competency on the landscape.

8. Looking Forward: Tree-Planting to Create Possibilities for Future Generations

In the subsection titled “Tradition coming and going” in Chapter 4, together with Box 4-1, I have described how Greenland is full of Danish influence. Danish cultural elements are recognizable in various parts of town landscapes, festive events, and habits. I have also described in Box 4-2 that traditional Greenlandic eating habits such as eating whale meat and fish still remain in concert with Danish habits. Among them, I would like to discuss traditions that actually came from outside Greenland but that take hold in Greenland to facilitate locals to cultivate the future. From Chapter 4 to Chapter 6, I have discussed sheep farming as an example of it. In this chapter, I take up another tradition. It is tree-planting, which the outsider, Danes introduced to Greenland, and which may serve Greenlanders to think innovatively of an alternative way of life as their climate becomes warmer.

In Greenland, there are six major plantations: four sites are in southern Greenland, namely Upernaviarsuk, where the Agricultural Research Station is located, Qanassiassat and Narsarsuaq near the bottom of Tunulliarfik Fjord, and Kuussuaq in Tasermiut Fjord; two sites from West Greenland, such as Qooqqut in Godthåb Fjord and Kangerlussuaq near the international airport. In addition, there are several small plantations in south Greenland. A plantation is not built in a day. The oldest plantations are almost 60 years old. As mentioned in Chapter 1, the oldest pine trees beside the plantation were planted over 100 years ago, and they have become rejuvenated with the recent warming temperatures.

Hobsbawm (1992:2-4) defines tradition as invariance. Tradition conveys authenticity and symbolic meanings so that it gives us an impression as if it has existed since time immemorial. In the case of tree-planting in Greenland, it is not clear yet if tree-planting has become a firm tradition in Greenland. This is because still no one is sure if tree-planting really serves Greenlanders in opening up future possibilities. However, the Arboretum by Narsarsuaq airport has formed part of a landscape of southern Greenland, and the oldest trees (called "Rosenvinge's trees," see below) are recognized as historic site.[57] We may be seeing a process of tree-planting becoming a tradition in Greenland.

There have been a lot of efforts to create these artificial forests in south Greenland in the past. What was an intention behind these plantations? Who made them? How were these plantations created? Answering these questions will show that it is not just the changing climate that will suddenly bring benefits to the local people. The purpose of this chapter is to review the history of plantations mainly in southern Greenland. By doing so, I will explore what kinds of processes, objectives, intentions, and organizational efforts lie behind the making of these plantations.

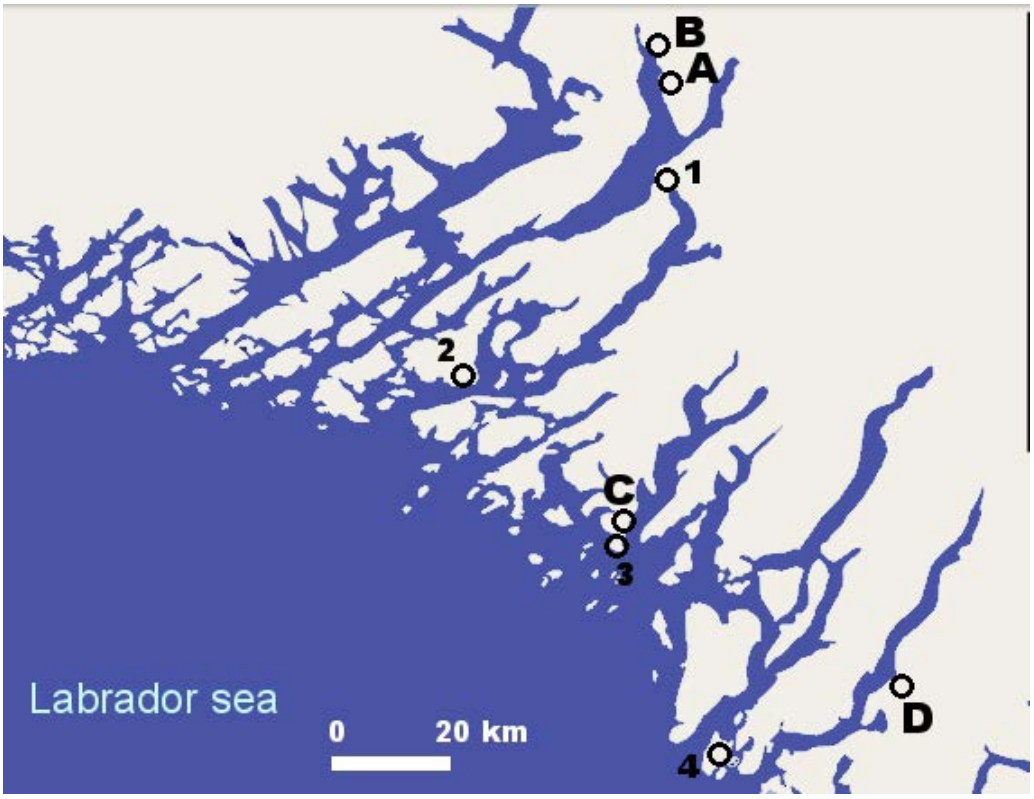
Green-coloured south Greenland

The landmass of southwestern Greenland is characterized by a complex of glaciated fjord shorelines, and it is as if the land was torn apart by a bear's claw in a northeast-to-southwest direction (Map 8-1). The rim of the interior ice cap is as close as only ten to twenty kilometres from the shorelines, at the nearest points, with active glaciers fed by the ice cap reaching the bottoms of the fjords. Several

[57] In 2011, these trees were adopted as the design of postal stamps.

land strips extending to the outer sea (Labrador Sea) are hilly and mountainous, including mountains with over 1500-metre peaks such as Illerfissalik, 1,752 metres above the sea level, north of Igaliku, and a number of small and large islands are scattered between and around the land strips.

Bleak as it may sound, a bird's eye view of south Greenland gives a sense of warmth to a viewer, particularly after having travelled to more northern places, such as Nuuk, where green is almost absent from the landscape. As one goes further back in the fjords, grasses and bushes covering the land are more conspicuous. Among the



Map 8-1. Plantations and neighbouring towns

Plantations A, Narsarsuaq; B, Qanassiassat; C, Alluitsoq (Lichtenau); D, Kuussuaq
1. Igaliku; 2, Qaqortoq; 3, Alluitsup Paa (Sydprøven); 4, Nanortalik

fjords, Tunulliarfik Fjord is one of the largest fjords in south Greenland. At the inner part of Tunulliarfik Fjord lies Narsarsuaq, where an airport serves as a transportation hub, international and domestic, of south Greenland. Just five minutes southward walk from a plain one-story airport building comes to the Greenland Arboretum. This arboretum is the product of a series of systematic plantation projects since the 1950s on the initiative of, mainly, Danish botanists. It publicly opened in 2004. Nearly 150 hectares of the hilly area of the inner fjord is covered by approximately 100,000 trees that represent 110 species from 600 provenances. In the front of the entrance of the arboretum, there is a plaque in honour of the late Dr. Søren Ødum who is the main contributor to the establishment of this arboretum. From 1976 till 1999 of his death, Ødum devoted himself to moving forward with plantation projects in Greenland, along with horticulturist Peter Birk.

Birk was around 80 years old and was still in good health when I first met him at the Qanassiassat plantation in 2009. This mild-mannered Danish man, who speaks Greenlandic very fluently, had actually worked on tree-planting, years before Ødum started. Qanassiassat lies around 8 kilometres further back of Narsarsuaq. There is a long winding path that goes around the bottom of the fjord from Narsarsuaq to Qassiarsuk, the opposite side of the fjord, but it is only 15 minutes by boat to get to Qanassiassat.

Approximately 1 hectare of the artificial forest stand at Qanassiassat consists mostly of Siberian larch (*Larix sibirica*), Scots pine (*Pinus sylvestris*), and Lodgepole pine (*Pinus contorta*). When viewed from the sea side, the deep green plantation clearly stands out from the background of pale coloured scrubs. The oldest cohort of coniferous trees is over 55 years old as of 2011, and they are now over 11 metres high.

To the north of this plantation stands an old, yet cozy hut, at which forest caretakers can stay during their short visit to this plantation. The hut comes equipped with a tiny kitchen, a cozy living room, and bunk beds. Pieces of boards hung on the wall by the firewood stove. On this board are the rules of using the hut. On an external wall is the washroom, which has much graffiti. These tell a long history of tree-planting projects.

Peter Birk was a regular user of this hut. Birk is a Greenland-born Dane and spent his childhood in Nuuk. He left Greenland to receive a post-secondary education, but he returned to Greenland because he wanted to settle closer to nature. When he decided to settle permanently in Greenland, he was told that his return to Greenland would cause him to give up swimming and forestry, which was part of his speciality. Although he gave up swimming, he managed to keep involved in forestry-related projects.

Incidentally, I include botanical explanations in the following sections because findings from the tree-planting experiments carried out so far are noteworthy from a forest science point of view. This chapter is based on the existing literature, web pages, and interviews I carried out. However, it took me a great deal of time and energy to organize the data. It seems to me that there is no official literature that registers a series of tree-planting projects comprehensively in chronological order. Some articles do not agree with each other for the planting year, the number of trees planted, tree species, the origins of trees, and so forth. The web pages that outline the plantations in Greenland include conflicting descriptions between the Danish and the English versions. In such cases, I adopt the Danish descriptions, since the Danish versions seem to be the originals. As for the process of tree-planting in Greenland, this chapter largely draws on the literature written by Søren Ødum, but his descriptions in English are

sometimes confusing and ambiguous. I use only the facts clearly stated in his articles, trying not to infer any of his information.

Fjord vegetation and the two conditions for tree growth in south Greenland

According to Köppen's climate classification, Greenland technically lies in the Arctic climatic zone, where the mean temperature during the warmest month of the year (usually July) does not exceed 10°C (Ulf Hansen 2001:67).[58] This climate condition does not allow trees to become established. However, the interior parts of the fjords in south Greenland, for example the bottom of valleys, are excluded from the Arctic zone as they fall into the Sub-Arctic zone. This climate zone is slightly warmer than the Arctic zone, and accordingly, unlike in treeless northern Greenland, relatively lush scrublands are found in the inner parts of the fjords in south Greenland. Roughly speaking, the Sub-Arctic zone covers Siberia, Alaska, Canada, Fennoscandia, Iceland, and extending to the inner fjords of south Greenland. The Sub-Arctic zone generally harbours broadleaved trees such as birches and coniferous trees such as pines, firs, and spruces. In the Sub-Arctic zone of Greenland, there are native broadleaved trees and shrubs: a few kinds of birches such as downy birch (*Betula pubescens*), dwarf birch (*B. nana*), and glandular birch (*B. glandulosa*); Greenland mountain ash (*Sorbus groenlandica*; hereafter, mountain ash); green

[58] Incidentally, the Arctic zone in Greenland is further divided by the 5°C isotherm of mean temperature: the Low Arctic zone and the High Arctic zone (Bay et al. 2001). The former is that area where mean temperatures during the warmest month lie between 5°C and 10°C, while the latter's mean temperatures during the warmest month are below 5°C. Accordingly, strictly speaking, south Greenland is classified as the Low Arctic zone. The border roughly coincides with the 70th parallel. Kangerlussuaq is close to this border, but its location (the inner fjord) gives a warmer climate compared to the coastal area at the same latitude.

alder (*Alnus crispa*); and northern willow (*Salix glauca*).[59] Creeping common juniper (*Juniperus communis ssp. nana*) is the only coniferous tree in Greenland. The lack of conifer except creeping juniper (in the form of shrub) in Greenland may be ascribed to the distances to the continents, which prevented the migration of a relatively heavier seeds, compared to broadleaved trees (Skov & Landskab 2009b). Therefore, it can be said that tree-planting in Greenland is an act to find coniferous tree niches within Greenland's environment.

Temperature during the growing season

In order to find a right place for tree-planting, it is important to study the conditions in which scrublands can be established. The fact that bushes are found in the inner part of fjords in southern Greenland means that these areas are free from the limiting factors for tree and shrub vegetation. This fact gives us a hint for tree-planting in Greenland. First of all, as mentioned above, the inner parts of the fjords have good temperature conditions for tree growth. It should be remembered that climatic conditions between the outer and inner parts of the fjord, with just a few dozen kilometres apart, are different. The difference of climatic conditions, together with edaphic conditions, is well reflected in the physiognomic difference in vegetation.

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[59] A downy birch is prevalent throughout south Greenland, including Tasermiut Fjord, Vatnahverfi between Igaliko- and Alluitsoq Fjords, hinterland behind Igaliku, the inner part of Tunulliarfik Fjord. It can be found up to Paamiut (ca. 62°N). A downy birch can grow up to a height of 8 metres under a favourable condition, but in most cases, they only form a small bush (Jensen 1994:53). Mountain ashes rarely form a mono-species forest, nor appear in birch scrubland, indicating it is less competitive; therefore, their occurrence is limited to the warmest slopes of the interior fjords. Yet, mountain ashes as tall as 10 metres can be found in valleys of Tasermiut, and relatively tall mountain ashes are present also in Tasermiut in Qorlortorsuaq, and Jespersens Dal behind Igaliku (Høegh 2011). A green alder can grow up to 7-8 meters high but tends to arch its trunk, which makes them look shorter. Northern willows vary in form and the vegetational structure (Jensen 1994:53).

Generally speaking, the inland areas of the fjords are warmer and drier than the coastal areas.

Let's look at Figure 8-1 that compares monthly mean temperatures and precipitations between Narsarsuaq and Qaqortoq. These two places are situated, approximately 60 kilometres apart, but their climate patters are significantly different in terms of tree growth. It is clear that while the monthly mean temperatures of Qaqortoq in July does not exceed 10°C, those of Narsarsuaq barely exceeds 10°C in July. Moreover, if included months whose average high temperature (the mean value of high temperature) are slightly below 10°C, the growing period can span 5 months, from May to September. Like this, it is actually very important for trees to have temperature above 10°C. The mean temperature in the warmest month of 10°C is known to be a threshold for the minimum temperature required for tree growth,

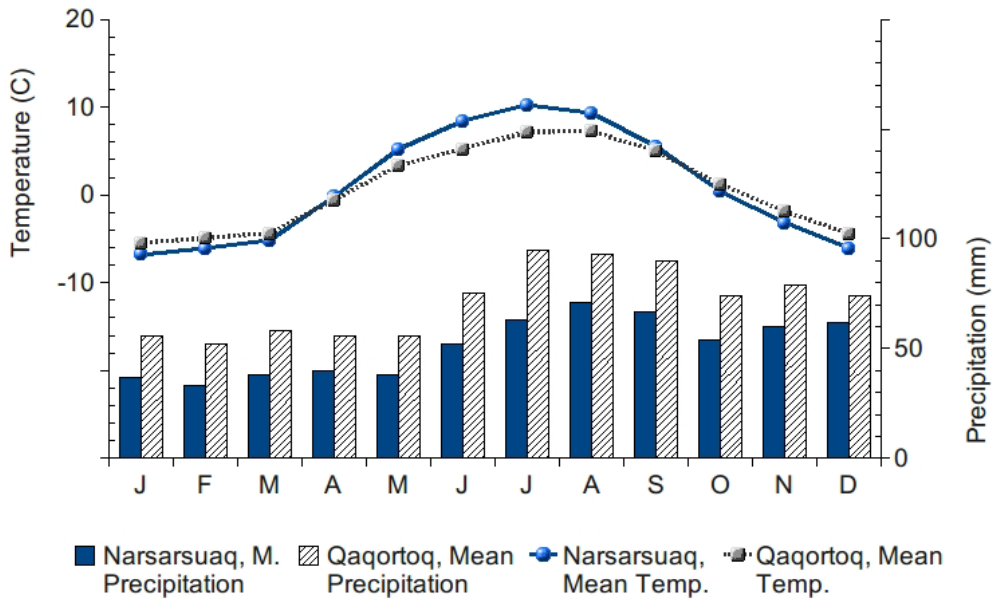

Figure 8-1. The comparison in mean temperature and mean precipitation between Narsarsuaq and Qaqortoq

which is widely used in botany. In addition, the figure shows Narsarsuaq is drier than Qaqortoq, with the annual precipitation being 615 mm and 858 mm, respectively. This level of precipitation meets the precondition for tree growth. To put it a different way, while willow and birch scrubs are found at Narsarsuaq and further back to the head of the fjord, in cooler Qaqortoq, birch trees cannot form a shrub and only creep along the ground at best.[60] This is usually attributed to strong (foehn) winds affecting tree and shrub growth.

Foehn winds

Second, it is very important for the trees to be free from a foehn wind, or *nigeq* in southern Greenlandic, which in the wintertime may cause fatal damage to trees. As mentioned in Chapter 4 regarding Qassiarsuk, foehn winds are high winds that blow down from the interior ice cap to the coastal area. They are very dry and warm, so that when it blows, the temperature will jump from the minus side to the plus side. The foehn wind often hampers local water and air traffic, and local people, who steer boats, were very conscious of wind conditions. What is more troublesome is that foehn winds are always followed by cooler weather. Consequently, partially-melted snow soon freezes and the ground surface is covered by ice. Trees can survive in a cold climate if there is snow on the ground, because ground snow serves as insulation for trees. However, the ground ice will hamper the root system of the trees, preventing them from being able to

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[60] With reference to the temperature and precipitation gradient within a fjord, Feilberg (1984) defines the climate of the coastal side of a fjord the "lowarctic–oceanic", that of the inner part of a fjord "subarctic–subcontinental." For the sake of simplicity, I state the climate of Narsarsuaq as the Sub-Arctic plus the continental type (in terms that the air is slightly drier) while that of Qaqortoq as the Arctic plus the oceanic type (in terms that the air is slightly humid).

breathe. Above all, high winds physically injure and desiccate tree trunks.

Therefore, from above, places where trees can form a shrubland in southern Greenland are confined to the inner fjord, and mainly on west-facing slopes that are in the lee from foehn winds from the interior ice cap. Upon planting, these conditions must be taken into consideration. Besides, since sheep are out to graze in the summertime, sites to be planted must be free from sheep or be protected by fences.

Warming temperatures in south Greenland

As far as monthly mean temperature is concerned, for the past 8 years, Qaqortoq has been significantly warmer than the 30 years between 1961 and 1990 (Figure 8-2). Previously, the monthly mean temperatures of April and October were -0.6°C and +1.2°C respectively,

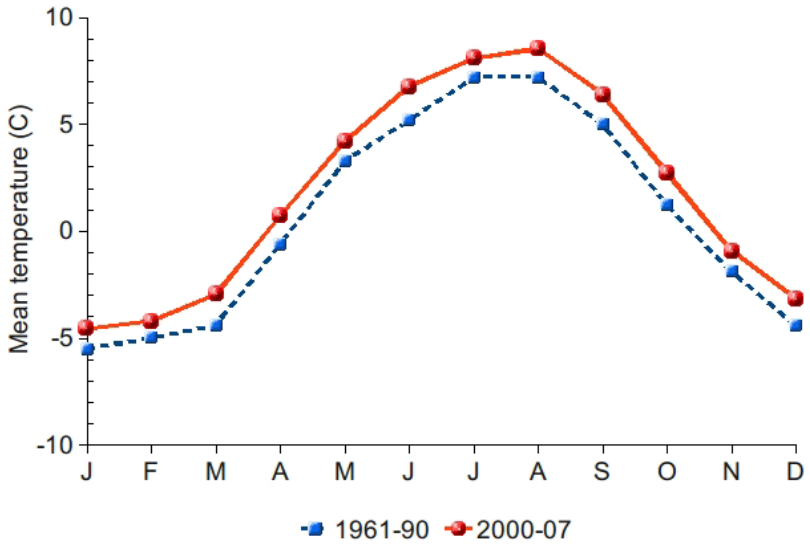

Figure 8-2. The difference in monthly mean temperature between recent years and 1960-90

while those of today are +0.7°C and +2.7°C. As far as the monthly mean temperature of April is concerned, it is a big change for plants for the temperature to be above the freezing point. Accordingly, the tree growth period has extended by two to three weeks. A similar trend is seen in the inner fjord, such as in Narsarsuaq. Interestingly enough, local residents expressed that the year 2007 was cooler than usual despite the fact that monthly mean temperature was higher than usual by more than 2°C. Presumably, this is because it rained more than usual. From this, we can see that the way people feel the changes in climate is different from the actual trends.

The sporadic introduction of foreign trees before the 1950s

The oldest known-record for the introduction of coniferous trees is that of the Herrnhut missionaries sowing Norway spruce at the Lichtenau (Alluitsoq) around 1846. The origin of the seeds is unknown, but probably they were obtained from central Europe (Ødum 1991:35; 2003:274). It has been reported that the spruces grew up to 1–3 metres, and that they were used for Christmas trees and decorations between 1898 and 1923. Today, there is no trace of these spruces. As mentioned in the introduction of this chapter, the oldest remaining trees are so-called Rosenvinge's trees (Rosenvinges Træer) near the head of Tunulliarfik Fjord. In 1892, botanist L. Kolderup-Rosenvinge brought in seeds of Scots pine and Norway spruce from Troms, North Norway (ca. 68°N) and sowed them at today's Qanassiassat (ca. 61°N).[61] Jørgensen (1949) reports that there remained eight pines and three spruces with their heights of 3.5 metres at the time he wrote

[61] Dr. Kåre Hellum (E-mail to the author, June 5, 2012) informed me that Norway spruce is not native to the west coast of Norway at least and that the seeds for these trees came from somewhere around Romania. Shortly after the last glacial retreat, it became possible for Norway spruce to migrate to Norway. Therefore, it is not certain whether Norway spruces planted in Greenland are of Norwegian origin.

his article, and when Ødum (1990) observed them, there remained six pines and one spruce of five metres. From my observation in 2008, there were only four pine trees. A scale of Rosenvinge's experiment was very small, but the remaining trees have proved that exotic (coniferous) trees could grow in south Greenland, which spurred a series of tree-planting projects afterwards.

In 1921-30, K.N. Christensen, the then Chief of the Sheep Breeding Station in Julianehåb (today's Qaqortoq), asked C. Syrach-Larsen, an initiator of the Arboretum in Hørsholm, Denmark and its director during 1937 to 1968, for co-operation to introduce trees into Greenland (Ødum 1990:46). Next year, C. Syrach-Larsen sent seeds and plants of coniferous trees to the Station, which included white spruce (*Picea glauca*) from Quebec, Canada, as its place of origin; Sitka spruce (*Picea sitchensis*) from Queen Charlotte Island, British Columbia (BC), Canada, and the Alaska coast; Engelmann spruce (*Picea engelmannii*) from the BC; Dahurian Larch (*Larix gmelinii*); Swiss pine (*Pinus cembra*); and Norway spruce (Finland). Christensen sowed and planted these materials at the Julianehåb district, but the fact that they all died out crushed his hope. Yet, Norway spruce planted at Qingua-dalen (Dan. *dalen* means valley) was found alive during the1933-34 survey.[62] It measured 2.4 metres in 1987 and may still be alive today (Ødum 1990). After that, C. Syrach-Larsen worked on planning another plantation, but it halted because of World War II (Ødum 1990).

Unexpectedly, a small-scale plantation was carried out during World War II. In 1941, a ship, Julius Thomsen, called near Battle Harbour (approx. 53° N), Labrador, on its way from the U.S. to Greenland due to difficult ice conditions. Captain R. Bang-

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[62] Today, Qingua-dalen is protected from the introduction of exotic species with bylaws adopted by the Greenland Parliament.

Christensen came up with the idea that he could take trees growing there to Greenland (Böcher 1977). He brought three buckets of young coniferous trees to Ivittuut (ca. 61°N), southwestern Greenland, where cryolite mining was taking place at that time, and planted them with help from the chief of the cryolite quarry, Sørensen. These trees, including white spruce and balsam fir (*Abies balsamea*), were still observed, as of just before 2003, but they could not grow over three metres tall, with their crowns dying back (Ødum 2003). As we shall see later, the reason why trees planted before 1950 all died, except a single Norway spruce at Qingua-dalen, is because the introduced trees were of southerly origins, or too oceanic.

C.A. Jørgensen, key person for plantation projects during the 1950s and the 1960s

If I can use the term "key person" that I introduced in the previous chapter, the key person for the initial stage of tree-planting projects (during the 1950s and 1960s) was C.A. Jørgensen.

Tree-planting in Qanassiassat and Upernaviarsuk in 1953

A series of large-scale organizational tree-planting started in 1953, which ended the time in which individuals only sporadically gave tree-planting a try. It all started when C.A. Jørgensen, a genetics professor at the Royal Veterinary and Agricultural University (Dan. *Den Kongelige Veterinær- Landbohøjskolen*), established in 1856 and now affiliated with Copenhagen University, visited south Greenland in 1947. Looking at local residents collecting firewood from birch scrubs, he became interested in large-scale planting so that artificial forests could offer more firewood.

Returning to Denmark, Jørgensen drew up a plan for planting trees with Syrach-Larsen of the University Arboretum and C.H. Bornebusch, the director of the State Forest Research Institute (Dan. *Det Forstlige Forsøgsvæsen*), which was approved by the Board of Greenland (Dan. *Grønlands Styrelse*). As a result of a scoping-out trip to southern Greenland in 1948, Jørgensen and Bornebusch were convinced that the west-facing slopes of the inner fjords would be the best places for a plantation and that the tree species for trial would be coniferous trees that grow in the cold regions, such as Canada, Alaska, northern Europe, and Siberia. They obtained seeds from forest research institutes in the Nordic countries and Canada, which were then sown and grown at the Hørsholm Arboretum and the State Forest Nursery, Humlebæk, in Denmark.

The time was ripe in 1953. Jørgensen brought a number of these northern trees into Greenland, with the help of five foresters, one of which was Peter Birk. During this project, 1 hectare of plantation was established at Qanassiassat, and at least 2,000 Norway spruces, originating from Helgeland, the most southerly district of North Norway, were planted on the site. Also, a 0.25 hectares of a plantation was set up on the premise of the Upernaviarsuk Research Station (see Chapter 4; The Sheep Breeding Station moved from Julianehåb to Upernaviarsuk in 1950.).

Tree-planting in Kuussuaq during 1959-61

During 1959-61, about 20,000 saplings, which Birk grew at Upernaviarsuk, were planted at Kuussuaq in the Tasermiut Fjord. The plantation consists of two adjacent plots, amounting up to 3-4 ha. The trees planted included Siberian larch from Krasnoyarsk, central Russia (the seeds were of Finnish origin); white spruce from Knik

River, north of Anchorage, southern Alaska and from Ontario and Saskatchewan, central Canada; and Lutz spruce (*Picea* x *lutzii*), which is a hybrid between white spruce and Sitka spruce, from Kenai Peninsula, south of Anchorage, southern Alaska. This plantation is the largest plantation with the exception of Greenland's Arboretum.

Sapling production

Saplings for the first plantation in 1953 were grown in Denmark (i.e., Arboretum and the State Forest Nursery). At this time, some problems were found, and among others, saplings tended to flush buds too early during the transportation of them. After that, it was decided to prepare saplings in Greenland.[63] Birk took on this task since he decided to permanently settle in Greenland in 1956 and lived in Upernaviarsuk, where he constructed a nursery. Seeds were sowed in cold frames. For the first two years, seedlings were kept in the cold frames, and for the next two years seedlings were placed outside. Then, they were transplanted on a decided plantation site in the fall (Jensen 1994:55).

Later on, the production of saplings was due largely to the co-operation of Iceland Forest Service (Dan. *Det Islandske skovvæsen*) (Ødum 1990:47; 1991:35). In other words, seeds collected at various provenances were sent to Iceland for testing, and then were forwarded to Greenland.

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[63] I should add that transplanted trees tend to be susceptible to a new environment and show a high mortality rate. This is because the trees' root systems often have not recovered at the time of transplanting and not because the new climate of the transplantation site is severe to them.

Other tree-planting actions during the 1950s and 60s

During the 1950s and 1960s, efforts were made to collect and select seeds widely from worldwide northern forests. Apart from the above-mentioned tree-planting projects, tree-planting was continuously carried out throughout the 1950s and the 1960s. For example, at Qanassiassat, Scots pine (presumably North Norway origin [Ødum 1990:56; 1991:54]) and 2,800 trees of Siberian fir (*Abies sibirica*, collected from Siberia and Mustila, Finland [Ødum 1990:52; 1991:54]) were planted between 1954 and 1961. Lodgepole pines were also planted at the same site in 1968 (Ødum 1991:43). At Upernaviarsuk, Siberian larch (of central Russian origins), Scots pine (of North Norwegian origin), and Lutz spruces (collected from Kenai Peninsula, southern Alaska) were planted in 1960 (Ødum 1991:49; Skov & Landskab 2009b). Alongside with tree-planting in south Greenland, a small number of trees were planted at two northern sites on a trial basis. A few Siberian larches were planted at Kangerlussuaq around 1960, and also Siberian larches and Lutz spruces were planted at Qooqqut, Godthåb Fjord, the source of which was the same stock used for Upernaviarsuk and Kuussuaq in the late 1950s (Ødum 1990:56; 1991:54). Eventually, Jørgensen passed away in 1968, but Birk continued to produce saplings at Upernaviarsuk and to plant them at Qanassiassat and nearby places from the 1950s and well into the 1960s.

Findings from tree-planting trials in the 1950s and 1960s

The period between the 1950s and the 1960s can be thought of as the screening stage, in which a wide variety of tree species and their provenances were tested. Some saplings established on the

Greenland's ground, and others failed to grow taller or just disappeared. As examples of unsuccessful cases among the trees Birk planted around Qanassiassat in the 1950s and 1960s, tamarack larch (*Larix laricina*) from Fairbanks, Alaska, black spruce (*Picea mariana*) from Goose Bay, Labrador, and Sitka spruce from Prince William Sound, Alaska did not grow very well or died out. Another unsuccessful example is almost all Siberian larches that were planted at Qanassiassat during 1954-61 died out (Ødum 1991:54). Although it is the same species as Rosenvinge planted, Norway spruce planted at Qanassiassat during 1953-54 scarcely remained, having succumbed to desiccation by foehn winds, heavy snow, and to dieback after cold summers (Ødum 1991:52-53). A further worse case was from the trees planted at the two northern sites around 1960, which did not grow taller, usually ending up becoming crooked (the so-called Krummholz formation), or just dying out.

On the other hand, the following materials proved to be adaptable to Greenland's climatic conditions: Siberian larch collected from central Russia, Scots pine from North Norway, white spruce and Lutz spruce collected in southern Alaska. The analysis of these results will be explained in a later section.

The participation of Søren Ødum, key person for tree-planting projects

It is not certain when Søren Ødum became interested in tree-planting in Greenland; however, it is known that he carried out tree-planting in Greenland in 1976 by way of an experiment, using a small number of trees of many different origins (Skov & Landskab 2009a). The saplings he used at that time were derived from stock collected by an expedition of the Hørsholm Arboretum at the US side of the central

Rocky Mountains in 1971. This seed and plant stock includes lodgepole pine, Engelmann spruce, and sub-alpine fir (*Abies lasiocarpa*), all of which compose the uppermost forest zone in the central Rocky Mountains, together with trembling aspen (*Populus tremuloides*). One of the purposes of the 1976 plantation may have been to test these alpine types of species under Greenland's climatic conditions. The saplings were prepared in Iceland beforehand, and then were transplanted to Upernaviarsuk, Narsarsuaq, and the two northern sites of Qooqqut (64°N), Godthåb Fjord, and Kangerlussuaq (67°N). Furthermore, a larger-scale plantation was conducted in Kangerlussuaq for a few years before and after 1977 (Ødum 1990:48&57; 1991:50), in which mainly the stock based on the Rocky Mountains collection were planted, with Scots pine and Norway spruce of northernmost Fennoscandian origin being added.

Results from the 1976 plantation

In terms of the survival rate of the trees, the 1976 plantation did not meet with much success. By the middle of the 2000s, for example, only 21 trees remained in Narsarsuaq (Skov & Landskab 2009a). Particularly, trees in the two northern plantation sites scarcely remained. However, there were some important findings from the observation of the remaining trees. Taking the trees planted at Narsarsuaq in 1976 as an example, a sub-species of lodgepole pine (*Pinus contorta* var. *latifolia*) from the Rocky Mountains were undamaged (as of 1986) although they did not grow taller for the first couple of years after plantation (Ødum 1991:45). Common lodgepole pines (*Pinus contorta*) collected from the Yukon and northern British Columbia (BC) were much better adapted to Greenland's climatic conditions. Engelmann spruce (collected from Colorado) were planted

in the spring of 1976, and most of them died out due to a very dry summer, but the remaining trees grew well a few years later (Ødum 1991:40). Interestingly, white spruce, taken from as southerly as South Dakota (44°N) at an elevation of ca. 1,500 meters, grew well. This shows not only the latitude but also the elevations of the place of origin are important.

A gradually-shaped guideline for tree collection

Alongside the use of the 1971 Rocky Mountains stock, Siberian larch, originated from Arkhangelsk, Russia and grown in Iceland, continued to be used for tree-planting. Yet, there was a need to screen a wider variety of tree species to determine what trees grew better in Greenland. In order to do this, the tree-planting team needed to collect trees from foreign countries. Since 1981, the destination of the tree collection trip has been focused on the tree lines of southern Alaska, of the Yukon-northern BC boarder (mainly for lodgepole pine), and of Fennoscandia. As for finding places that produce trees adaptable to Greenland's climatic conditions, the tree-planting team just learned from their experiences through a continual process of trial and error. It was not until around 1980 that these things were understood. The following subsections explain how these places were determined. Incidentally, they focused on seeds collection at first, but they started to collect saplings as well by directly digging them out.

The first key component of successful tree collection

Among others, it was revealed that in terms of vegetation, the inner fjords of south Greenland resemble the cool coastal and/or alpine tree lines of the northwestern parts of the North American and the

Eurasian (including Fennoscandia) continents, more than lowland tree lines of the central and eastern parts of both continents (Ødum 1991:56). This is clear from the results in which trees collected from higher elevations from the northwestern parts of both continents have been, in many cases, highly adaptable to Greenland's changeable climatic conditions, while many trees of lowland origins failed to establish at the plantation sites.

For example, Siberian fir (from Eurasia), black spruce and tamarack larch taken from the northeastern lowlands of the North American continents, did not establish in Greenland. Accordingly, these species were not worth testing in south Greenland any more. On the contrary, as mentioned above, lodgepole pine collected from Skagway, Alaska, and the Yukon-northern BC area generally grew well. Even though their latitudes are relatively lower, lodgepole pine saplings obtained at the alpine and/or tree line areas of the Rocky Mountains are adaptable to south Greenland. Later on, although it grows very slow, sub-alpine fir (*Abies lasiocarpa*) proved to be a promising species, which was collected in 1981 on Keno Hill, Yukon, at the elevation of 1,100 metres (Ødum 1991:40).

Interestingly, if the oceanic property is added, samples from the northwest of North America shows excellent survival rates in south Greenland. Adopting Ske (1988)'s conclusion, Ødum (1991:57) speculates that trees influenced by the oceanic climate may be tolerant to changing weather conditions during the growing period. Accordingly, samples collected around the coastal mountain ranges in southern Alaska were, all in all, good materials for planting. The best case in point is white spruce collected at Broad Pass, with elevations of over 500 metres (Ødum 1991:42&57). Also, white spruce saplings obtained from Kinik River, despite the low elevation, survived in Kuussuaq at fairy high rates (Ødum 1991:42). Also, Lutz spruce,

obtained from southern Alaska (Tsania-Thompson Pass and Kenai Peninsula) proved promising (Ødum 1991:42-43). Among 1000 Lutz spruces planted at Kuussuaq in 1959-61, 788 trees remained in 1987 (Ødum 1990:50). Therefore, an important point for tree sample collection is to choose right places of origin.

Moreover, even the same species have different adaptability between their places of origins. For example, Norway spruce taken from Helgeland, the southernmost part of North Norway (ca. 65°N), did not grow at Qanassiassat (Ødum 1991:52), while the ones Rosenvinge brought in from Troms, the northern part of North Norway (69°N) survived. Similarly, Scots pine taken from Siberia did not grow very well (Ødum 1991:56), while the same species obtained from North Norway, planted at Qanassiassat, grew slowly, yet steadily (Ødum 1991:53-54). While white spruces at Kuussuaq, which was taken from the Canadian prairies (Saskatchewan and Ontario) failed to establish themselves, the ones collected from southern Alaska showed relative good adaptability, although its growth rate was slow. Thus, the first key component of successful tree sample collection is the selection of the place of origin, rather than choice of species.

The second key component of successful tree collection

The second key component of tree collection is to fetch saplings from the tree line of a more northerly latitude than the intended plantation site. Alpine trees growing at tree lines have already proved to be hardy enough to survive low temperatures. In addition, it is well known that if transplanted southerly, trees tend to delay bud-break, and to mature earlier than at its original place because the timing of bud break and dormancy has to do with the length of the photoperiod. This enables trees, if obtained from the sub-alpine zone with higher

latitudes, to adapt to the later spring and earlier fall in Greenland, reducing the risk of freezing and desiccation caused by foehn winds.

Tree collection trips

In 1981, an expedition was made to Alaska and the western Yukon to collect seeds and plants from or close to tree lines. Since seeds are not produced every year at the tree line (usually at long intervals), it was decided to directly dig up young trees on site.[64] These were white spruce, Lutz spruce, sub-alpine fir (*Abies lasiocarpa*), broad-leaved lodgepole pine, and trembling poplars (*Populus tremuloides*), and balsam poplar (*P. balsamifera*), which were planted at Kuussuaq, Narsarsuaq, Qooqqut, and Kangerlussuaq in 1982 and1983, together with the trees from the stock made by the 1971 Rocky Mountains expedition. In 1982 Ødum resumed tree-planting with Birk and continued tree-planting every year until 1998, particularly after 200 hectares of the hilly area at Narsarsuaq was set aside for the Greenland Arboretum (Ødum 2003:274). This area, being just beside the international airport and a small harbour, is convenient for transportation. In addition, the area is free of sheep.

A spell of cool summers testing tree properties

The summers from 1982 to 1984 were the coolest in 28 years. The mean temperatures at Upernaviarsuk during the period from May 21 to September 20 were 1.5C, with the year 1984 being the coolest

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[64] According to the literature on tree-planting in Greenland, it is clear that seeds were used in the early stages and later live trees (saplings) were used for transplanting. However, there are many uncertain descriptions in the literature I have on tree-planting projects in Greenland. Therefore, in this case, I am not certain whether seeds or saplings were used and I use "trees" in this chapter to avoid mistakes.

(Ødum 1990:44). Many trees at plantations were significantly damaged and/or killed by what Ødum calls the "test summers" in that the trees were tested for their endurance to lower temperatures. In addition, larches at Kuussuaq were reduced to less than 20 percent due to larch canker (*Potebniamyces coniferarum*) during 1980-85, which were probably encouraged by cooler summers. These hardships further made the tree-planting policy more realistic.

Finding an imaginary tree line

An interesting finding is that, as Ødum (1990:43-44; 1991:34-35) suggests, there may be an imaginary coniferous tree line in Greenland. Tree line is an approximate region above which trees rarely exist due to harsh geo-climatic conditions. Just below the tree line, the sub-alpine zone is composed of conifers such as spruces and firs, while above the tree line, in central Japan for example, only dwarf or crooked birches can be found. Greenland lacks arboreal conifers (conifers growing taller) that would constitute the sub-alpine zone. As Rosenvinge proved, coniferous trees are able to establish in Greenland if there were, but it may be that conifers just did not migrate into Greenland in the past. Therefore, it can be said that tree-planting in Greenland means "restoring" the lost tree line that could have formed somewhere in south Greenland if coniferous trees had been there. Perhaps, tree-planting should be carried out just below the imaginary tree line.

Where is the potential tree line? Because no arboreal conifers are found, there is no other way than to speculate on the imaginary tree line from the existing broad-leaved trees, namely, Greenland mountain ash (*Sorbus groenlandica*), downy birch (*Betula pubescens*), and green alder (*Alnus crispa*). These trees are found near tree lines

elsewhere in other parts of the globe. In the coastal mountains of Alaska, the local species of mountain ash (*Sorbus scopulina*, related to Greenland mountain ash) never appears above the tree line, nor do American mountain ash (*Sorbus americana*, related to Greenland mountain ash) in the White Mountains, New Hampshire. Compared to mountain ash, downy birches can be found above tree lines composed of Scots pines and Norway spruces in Scandinavia. Similarly, green alders form shrubs above tree lines in the White Mountains. Moreover, in horizontal terms, Alaskan local alder (*Alnus sinuata*, related to green alder) appears further north than the limit of white spruce. These facts show that the occurrence of downy birches or green alders does not necessarily suggest an imaginary tree line in Greenland. Perhaps, the tree line lies well below or further south than where these species occur. On the other hand, mountain ashes are more demanding than birches and alders. Therefore, Ødum suggests that a hypothetical tree line may lie where Greenland mountain ash occurs, or just above it. In order to decide where to plant, it is important to get a picture of an imaginary tree line in introducing trees into Greenland.

Tree-planting after 1980

In 1982, Ødum restarted tree-planting at Narsarsuaq with Birk. It seems that during the 1980s he focused on North America to collect trees. For example, expeditions to northwestern North American (mainly Alaska, the Yukon, and the Northwest Territories) were made in 1982, 1983, 1985, 1988, and 1991. Particularly, during 1987-88, tree-planting programs were financially supported by the Co-ordinating Committee for Nordic Forest Research, and trees were widely collected from the Rocky Mountains, Alberta (AB), Canada, to

Alaska, which contributed to the expansion of their tree collection.[65] Also, trees were used for test-planting in Scandinavian countries other than Greenland (Jensen 1994).

An expedition team was always a small group, just made of a few of people. Birk very often joined an expedition. In the 1990s, students from the agriculture department of Copenhagen University joined an expedition and a team collected trees from areas other than North America, such as Europe including the Scandinavian Peninsula. Trees collected from various parts of North American and Eurasian continents were added to plantations in Greenland, particularly at the Greenland Arboretum.

The addition to northern plantations

In 1983, trees of Alaska, Yukon, and Fennoscandia origins were added to the two northern plantations but the results were not particularly good. Among the best of these were alpine species, such as white spruce and subalpine fir, and a few broad-leaved trees including downy birch and trembling aspen (*Populus tremuloides*) and balsam poplar (*P. balsamifera*). Interestingly, Greenland's native downy trees, transplanted from Tunulliarfik Fjord to Qooqqut, died out while ones from northern Sweden looked well adapted.

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[65] Nordic Forest Research Co-operation Committee (Dan. *Samarbejdsnævnet for Nordisk Skovforskning*, SNS, the former *SamNordisk Skovforskning*) is a collaborative body, the board of which consists of two members from Denmark, Finland, Iceland, Norway, and Sweden, and one observer from Åland, Faeroe Islands and Greenland (SNS 2011). It is financed with Nordic funds through the Nordic Council of Ministers, and the overall objective is to promote various fields of forest research and to advise Nordic Council of Ministers on matters regarding forests and forest research.

The establishment of the Narsarsuaq arboretum

When the idea about establishing an arboretum at Narsarsuaq became realistic, much effort was devoted to tree-planting at Narsarsuaq after the latter part of the 1980s. In 1987, large-scale tree-planting was carried out at the prospective Arboretum, the sources of which were from the 1971 Rocky Mountains expedition and the northwestern North America expeditions in 1982 and 1985. Also, broad-leaved trees were planted, such as birches (*Betula* spp.), alders (*Alnus* spp.), prunuses (*Prunus* spp.), mountain ashes (*Sorbus* spp.), poplars (*Populus* spp.), willows (*Salix* spp.), and some other species.

Another large-scale plantation followed it in 1988, where about 20,000 trees were planted in the Arboretum. Among 20,000 trees, 10,000 Lutz spruces and 4,000 Norway spruces were received from Mo i Rana, North Norway, and 5,000 lodgepole pines were obtained from Stewart Crossing, Yukon (Skov & Landskab 2009a). These trees were expected to create windbreakers, so that they may facilitate planting of species that need to be shielded from foehn winds. Planting windbreaks continued in 1989, 1991, 1992, 1994, 1998, 2001, and 2002 (as of 2004). At the same time, Siberian larches of Arkhangelsk origin, prepared in Iceland, continued to be planted in the Arboretum at Narsarsuaq during 1991-2002, the number of which amounted to 75,000 (Skov & Landskab 2009a).

The species planted most at Narsarsuaq are white spruce, the northwestern variation of Siberian larch, subalpine fir (*Abies lasiocarpa*), inland-growing, broad-leaved lodgepole pine (from northwestern North American origin). In addition, Norway spruce and Scots pine originated from tree lines of North Norway, and Engelmann spruce of Colorado origin (Jensen 1994; Skov & Landskab 2009b). Rather rare species include subalpine larch (*Larix lyallii*),

hybrid larch between subalpine larch and western larch (*Larix occidentalis*), Himalayan birch (*Betula utilis*), small-leaf rowan (*Sorbus microphylla*), and Wych elm (*Ulmus glabra*).

Expeditions in the 1990s

Expeditions for materials to be used to expand the plantation sites were made during the 1990s and are as follows:

1) An expedition to the Scandinavian mountain range in 1990.
2) Northern and central North America in 1993 (Mountains in BC, AB, Churchill on the coast of Hudson Bay in Manitoba, and Ungava Bay of northern Quebec);
3) White Mountains, New Hampshire, and Labrador in 1993, where about 5,000 saplings were obtained;
4) European Alps in 1998;
5) Additionally, Asian trees were obtained from northwestern Nepal, the Himalayas in 1999. This was conducted as part of a program of the Danish International Development Agency (DANIDA);
6) Also, additionally, trees were collected from northeastern Siberia (the northern Urals, Kamchatka peninsula) in co-operation with the Hørsholm Arboretum in Denmark and the Iceland Forest Service.

The significance of the Greenland Arboretum

The following points are raised for the Greenland Arboretum. First of all, the objective of the Greenland Arboretum is to select tree species and their provenances so that they can adapt to Greenland's climatic conditions. This has something in common with what is called

"assisted migration" in the context of the forest adaptive management of recent years (Ste-Marie et al. 2011). As we have just seen, many lessons were learned from the past tree-planting programs and these results are reflected in the Arboretum as well as other plantations (Ødum 1991). Since it covers a wide range of species and provenances, the Arboretum is expected to become a good model that will provide the frame of reference upon making new plantations elsewhere in Greenland, planning town landscapes, and gardening. The production of Christmas trees for local inhabitants may be possible in future. It also can be used as a recreational forest for tourism purposes. Furthermore, since Greenland is geographically isolated from industrial areas, change in climate may be purely reflected in a form of annual growth ring and growth behaviour, such as rejuvenated Rosenvinge's pine trees.

Thinning at Kuussuaq and trial timber production

The Kuussuaq plantation was thinned out in 2005 in order to improve the growth rate and health of the rest of the trees. The logs were utilized to make fence posts and timber, with a small portion being used for firewood. Although the plantation lost most of its larches with larch canker during 1980-85 and had damage caused by cold summers during 1982-84, Lutz spruces and later-planted lodgepole pines, both originated from southern Alaska, were prominent, with tree heights being around 10 metres.

The initial goal of this plantation at the time of the establishment (during 1959-61) was to explore the possibility of the supply of firewood for local consumption, by testing species of different origins. As mentioned earlier, the use of birch trees for heating and cooking was common up until the 1970s in southern Greenland. After

fifty years, firewood is no longer utilized for heating and cooking as energy sources have changed. It was decided to use this opportunity to estimate profitability of small-scale timber production in Greenland.

A grand plan for the making of a 100-hectare forest

After the death of Ødum, an officer from the Agricultural Advisory Office in Qaqortoq took over a role of the prime mover in tree-planting projects. He is a Greenlander with Danish heritage; he was born in Greenland and grew up in Denmark to receive a secondary and post-secondary education.

In September 2008, he organized a team comprised of one officer from Greenland's government and two forestry researchers from the Iceland Forest Service. The team surveyed the area just south of Qanassiassat to find a site for a 100-hectare plantation. Through this four-day topological survey, in which I participated, the team grasped a big picture view of where to build fences, where to plant windbreak trees, and what tree species could be used in which places. The area of the plantations made so far, such as Qanassiassat and Kuussuaq, was at best some 5 hectares in a total. Timber production of this size is not commercially viable. Presumably 100 hectares is necessary to make a profit from timber production. He also hoped to explore the possibility of agroforestry at this site, in which sheep can graze the underlayer in the plantation, while improving the forest stand condition. If sheep farmers nearby are in favour of this project, there is a possibility for the realization of community-based forest management. If this is not feasible, the forest can be used, at least, for recreational and tourism purposes. This officer said that there was no immediate need for this plantation at this point, and he was not sure if it would serve future generations. Yet, he insisted that the

important thing for now is that his generation create forests, so that future generations can decide how they should be used. He hoped that future generations in Greenland will have more options for their lives.

Discussion: the significance of plantations

In Greenland, there has not been any government section in charge of overseeing tree-planting. While holding their main careers, those who are concerned with tree-planting spared time for it on a volunteer basis and made an effort to muster financial support to make it happen.

It should be noted that an idea of making plantations in Greenland was developed by Danish scientists, as outsiders, independently of local communities' requests. The objective of making plantations at the initial stage was exploring the possibility of the supply of firewood. Presumably, an idea of making artificial forests would not have occurred in a Greenlander's mind because it might have been foreign to them. This might be only an idea of those who live in the temperate zone and are familiar with arboreal vegetation from everyday experience. As is often the case with colonial states, new traditions and institutions are brought in from their suzerain states whose people temporarily shuttle between their own country and their colonial states. Citizens of suzerain states tend to see their colonial states from their ideological and moral perspective. As just described, the creation of traditions and institutions may require input from the outside so that insiders can create ideas and alternative ways of thinking that would not otherwise be possible to arise within the scope of their thinking.

Just as the introduction of sheep farming, this was the beginning of a long-term experiment that still continues. A series of tree-

planting projects were initiated and carried out on the Danish initiative. Soon, it turned out that it was quite a challenging experiment under the sub-arctic climate conditions. Many trees died due to severe weather conditions and/or diseases. It was a continuing process of trial and error and through a number of failures, people including Ødum and Birk gradually shaped a guideline for the selection of tree species and their provenances.

Danish academic and governmental institutes, as well as those of Scandinavian countries, to a great deal, assisted the collection of seeds and saplings to be introduced into Greenland. Particularly, the production of saplings was due largely to the co-operation of Iceland. Knowledge, technology input, and financial support from the outside world, such as Denmark and other Nordic countries, is important when promoting new endeavours. These would not have been possible without networking among Nordic countries, which is exactly based on the existing tradition that Greenland nurtured.

The creation of traditions is often triggered when confronting a dead-end political and/or social situation, which could not be addressed within an existing norm, and making an effort to break through it. However, firewood supply in those days, if anything, would not have been a big issue. If so, it follows that tree-planting in Greenland was not initiated by a strong need to get out of a difficult bind. This is the case for the introduction of sheep farming. There is an explanation that sheep farming was introduced in order to alleviate food shortages caused by a decline in the seal catch; however, if we adopt the explanation that the introduction of sheep farming was rather induced by the change in Danish awareness towards Greenlandic polity caused by domestic political upheaval, it cannot be said that sheep farming was introduced because Greenlanders were caught in an economic quagmire. Rather, I see Danes experimentally brought in trees,

picturing a better life for Greenlanders based on their stand point, or perhaps Danish scientists just wanted to satisfy their intellectual curiosity. Therefore, we can think of a development model, in which the creation of a tradition in Greenland is often brought in by outsiders on an experimental basis, and the tradition is then gradually taken over by Greenlanders. In this respect, it can be said Greenland is a country of experiment by looking ahead into future possibilities.

A difference between sheep farming and tree-planting is that tree-planting has not yet involved many Greenlandic actors, compared to sheep farming. In the case of sheep farming, hundreds of Greenlanders have engaged in sheep farming since its onset, and Greenlanders gradually took over the role of key person. In this respect, a tradition of sheep farming was created by exogenous stimuli and has gradually taken a unique position in (southern) Greenlandic culture. On the other hand, there are only one or two individuals as of 2009, who are taking the initiative on tree-planting. I can only count four individuals for key persons: outsiders, Jørgensen and Ødum, and Greenland resident Peter Birk, and one officer at the Agricultural Advisory Office. Accordingly, I assume that tree-planting in Greenland is still at a transitional stage and whether this initiative takes hold in Greenlandic cultural soil depends on whether more Greenlanders can value the use of plantations when searching for a better way of life in the future.

I point out, however, that an awareness of the significance of making a forest can be recognized in the above mentioned officer's remarks. He insists that planting trees is like an investment for future generations, leaving possibilities open for choosing an alternative way of life. He continues by saying that even though we do not know yet what values a plantation will have, what is important now is to make a forest, and that how it can be used is what future

generations can decide. Finally, I would like to emphasize that this perspective – envisioning the future and then opening up possibilities to gain a better way of life – are necessary to create a tradition.

Concluding remarks: The need to encourage locals to participate in processes

Just as in sheep farming's case, Danes who were inspired to contribute to the betterment of Greenlanders brought trees to Greenland. Perhaps, they might have just wanted to satisfy their scientific curiosity. Whether the impetus was out of a spirit of social transformation or scientific curiosity, they innovatively held a vision for the future in Greenland. Whether tree-planting programs are successfully taken over by Greenlanders is uncertain. If locals can find a value in tree-planting when cultivating the future, tree-planting will be able to take hold in Greenland's cultural landscape.

Here I discuss whether tree-planting can become a tradition or not. I argue that endogenous development of a locale necessitates a process of re/creation of a tradition with reference to exogenous knowledge, technology, and institutions, while valuing the existing cultural traits (e.g., the existing tradition) and the existing human-environment relationship (Tsurumi 1989, 1996). Although I have used Hobsbawm's (1992) tradition and Tsurumi's (1996) tradition, I have not clarified the difference in meaning between them. Hobsbawm's tradition is an end product of processes of formalization and ritualization of some social practice. His tradition comes to a dead end, losing solutions to deal with unforeseen and unprecedented issues. On the other hand, what Tsurumi says is tradition is a new one to overcome a dead end. Her tradition may follow the same path as Hobsbawm's; however, her emphasis is on the making of a tradition

to overcome the current difficulties that afflict locals. In order to make a tradition, key persons are necessary, who can think of the future in a way that others can hardly think of and then try to implement it. In this regard, they are required to have psychological flexibility, an innovative nature, and creativity, not simply a mind to pursue only material satisfaction. Therefore, I discussed farmers' inner world or mindset in Chapters 4 and 7, their frame of reference (from the past) in Chapter 5, and the importance of the appearance of key persons in Chapter 6.

Whether tree-planting will take hold in Greenland depends on:

1) whether key persons who can envision an alternative way of life making use of plantations appear in the area,

2) whether more locals are inspired to participate in the process of the creation of tradition,

3) whether they can have a long-term perspective, and

4) whether larger forces, such as government support, can encourage these people to freely envision the future and to carry out their project.

Just as Rosenvinge's trees tell us today, the past practice based on envisioning the future can open up possibilities after a hundred years.

Finally, I would like to further the third point of the importance of a long-term perspective. I develop a discussion of the fourth point in the next chapter. Making a forest requires a perspective of looking ahead to the next hundred years. It is not uncommon for a 200-year span to be within the scope of forest management planning in Canada, and 100 years in Japan. A dendrochronological study shows that trees in Greenland grow in a similar way to those in other parts of the subarctic zone in the northern hemisphere. With reference to the fact that in Lapland, Finland, Scots pines and Norway spruce take a couple of hundred years just to reach a height of 15 metres and 40

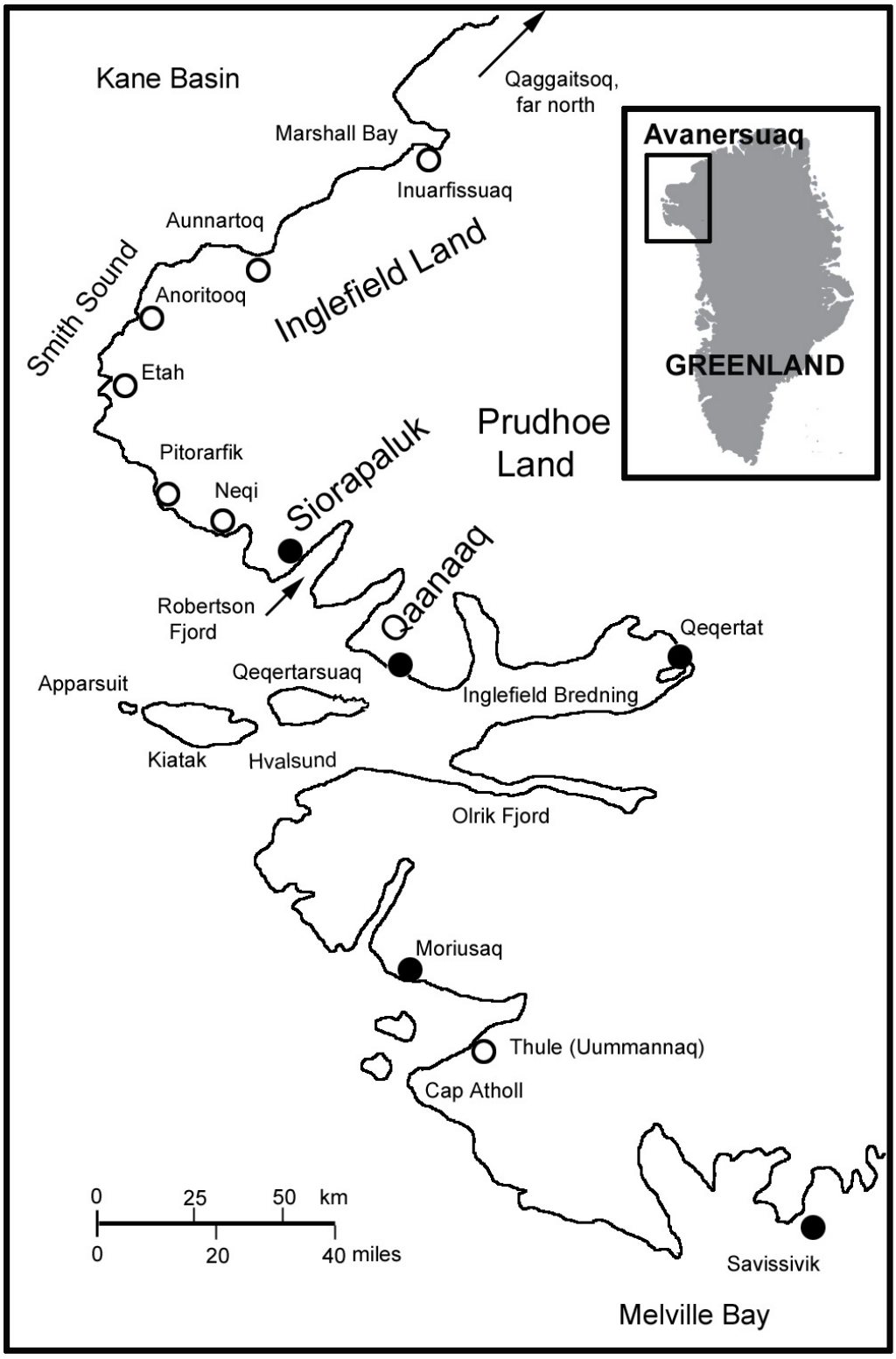
centimetres in diameter. This is very likely the case in plantations in Greenland.

Moreover, just a brief review of Greenland's history makes us notice the need of a long-term perspective. Greenland has been historically under the sway of climate change. When the Vikings/Norsemen settled in south Greenland in the end of the 10th century, the climate was much warmer than today, so that they were able to engage in animal husbandry, just as they had previously done in Iceland and Norway. Afterwards, the Norse settlements were desolated due to cooler climate. When Norwegian missionary Hans Egede arrived in west Greenland, he was greeted by Thule people, who are direct ancestors of today's Inuit Greenlanders and had survived the so-called Little Ice Age. During the 19th century, the temperature was still low, but the end of the 19th century, the temperature began to show an upward trend. Did Rosenvinge ever anticipate a warming trend in the future? In the 1960s and 1970s the temperature was on the downward trend for a short period, but for the past three decades, it has been warmer again. Trees planted in south Greenland during that period of time, are now favoured by the increase in temperature. Finally, it takes time particularly for a forest to become established in a new environment and not simply forest plantations but all kinds of traditions will require a long period of time to take root in a society. Rosenvinge's trees, Greenland's Arboretum, and other plantations show a need for a long-term view upon implementing a new endeavour to create a tradition.

9. Hunters and Hindrances in Northern Greenland: Larger Forces That Discourage Locals From Envisioning the Future

Hunting, on land or at sea, has traditionally been an integral part of the way of life in northern Greenland. Every one of the hunting practices, actions, and associated chores have fostered sociocultural values and underpinned local economies (Nuttall 1992). This remains true still today in spite of the fact that hunting has long been involved in the cash economy (Dahl 2000). This is particularly the case in Avanersuaq (the Thule district, the northern part of North Greenland), where a large number of people base their livelihoods primarily on hunting (Map 9-1).

For anthropologists and archaeologists, Inuit's highly-developed adaptive capacity to the Arctic environment has been one of the long-standing research interests (e.g., Krupnik 1993; McGhee 2005; Nelson 1969, 1981; Vaughan 1991). The literature on Inuit shows that they acquired a remarkable breadth of knowledge on their environment through long-term experience of hunting, managing difficult situations adeptly, and were dexterous enough to make hunting equipment and sledges. With their competency on land and at sea, they circumscribed the Polar region such as Chukotka, to Alaska, to Canada, and to Greenland for centuries. However, recently, it has been said in the media and scholarly works that Inuit, who show such an excellent capability of adaptation and its long history, are highly vulnerable to global climate change and associated environmental change (Struzik 2007; IPCC Core Writing Team et al. 2007).



Map 9-1. Avanersuaq (northern part of northern Greenland)

Why is it said so? In order to properly understand this kind of account, we need not only to investigate hunters' coping strategies but also to consider larger forces such as the social, economic, and political situation surrounding the locality in question and Greenland as a whole. As I reviewed in Chapter 2, the broader social, economic, and political forces may hinder or even nullify the local initiatives. It is important to examine whether local initiatives are in harmony with the broader context in which the locality is situated, or are hampered by these broader forces.

This chapter does not particularly deal with creation of tradition, but in terms that coping processes (with climate change) requires creative capacity and innovative nature from individuals in order to hold a vision of a better future, this chapter is an extension of the previous chapters.

Using the framework of vulnerability study, this chapter discusses the vulnerability of hunters in northern Greenland, by identifying the local hunters' coping processes, and examines how their adaptation processes have been constrained by broader forces, with reference to the social, cultural, and historical processes. However, it is not sufficient to better understand matters of climate change, as I argued in Chapter 2. This chapter is a stepping stone for the next chapter, which further discusses this matter.

Study areas and methods

In this chapter, I describe climate change impacts on hunters' lives in the community of Siorapaluk, with a secondary emphasis on the town on Qaanaaq (Map 9-1), which is the centre of the inhabited area of Avanersuaq.

The town was founded when all the residents of Uummannaq (Dundas) and the nearby settlements were forcefully relocated due to the establishment of a US airbase there during the early 1950s (Lynge 2002). Currently, approximately six hundred people inhabit Qaanaaq. Neighbouring settlements include Siorapaluk, Qeqertaq, Moriusaq, and Savissivik.[66] Inhabitants of these settlements and the town enjoy close kinship and they often travel between these places for hunting, communication, and for attending special occasions. Siorapaluk is the northernmost settlement in Greenland (and one of the northernmost inhabited settlements in the world). Some of the establishments in this settlement include a small, but all-purpose grocery/general store with a post office, a power plant, an elementary school, and an administrative office. Some people work at these places, though typically wives work as school teachers; however, the majority of the heads of families are hunters. Some hunters may go fishing, but hunters in Avanersuaq, if at all, only fish occasionally. While statistical data show 72 people lived in Siorapaluk as of January 2009 (Statistics Greenland n.d.), about a dozen active hunters make the settlement's population fluid. Once a hunting season starts, such as the season of guillemot hunting, the majority of the families move to nearby camp sites. There are, in effect, several camp sites north of Siorapaluk, which were once inhabited, such as Neqi, Pitorarfik, Etah, Anoritooq, Aunnartoq, Inuarfissuaq, and Qaqqaitsoq (Map 9-1). Some camp sites have been used since the archaeological era, and until recently these sites were sporadically inhabited (Malaurie 1982).[67]

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[66] As of December 2009, the population of Moriusaq is only 2 (Statistics Greenland n.d.), and this settlement is very likely to fade away.

[67] Inglefield Land of Avanersuaq provided the nearest human colonization routes from Canada for four millennium. The Thule people (the modern Inuit, direct ancestors of Today's Inuit Greenlanders) developed in coastal Alaska and migrated into Greenland by the 13th century from the Canadian Arctic. They continuously migrated southward and had contact with Norse Greenlanders (Viking) in the 14th

I carried out fieldwork mainly in Siorapaluk for approximately two weeks in April and May 2009. During my stay in Siorapaluk, I participated in hunting, in the settlement's spring festival, and in elementary school classes. I observed people's chores and interviewed four hunters. Later on, I also visited Qaanaaq and interviewed three hunters there. The follow-up survey by mailing continued until February 2011. In addition, I supplement my field data with secondary data (two hunters' accounts on climate change in Siorapaluk and one in Qaanaaq) that were collected by the Arctic Inuit Climate Change Ethnographies (ICCE) Project (Jennings n.d.). In order to make a comparison between the past and the current conditions of hunting, I employ the existing literature with an additional reference to a documentary film on Siorapaluk shot in 1976–77. The literature I use in this paper includes an ethnography by Jean Malaurie, a French ethnographer, (1982) based on his stay in 1950–51, and also Ikuo Ôshima's (1989) semi-autobiography (Ôshima became a hunter in Siorapaluk several years before his Japanese expedition team's conquest of the North Pole in 1978). Although these are not academic writings, they are useful aids for understanding the seasonal cycle of hunters before climate change became conspicuous. The distribution of animal species and their migration routes vary from fjord to fjord, and this chapter deals with the northern part of this district, i.e., excluding the Savissivik area.

Along the coastlines of Melville Bay, stretching more than three hundred kilometres southward from Savissivik, there is no human habitation due to glaciers. This geographical feature might have contributed to how the historical development of social, cultural, and linguistic characteristics of Avanersuaq differ from other parts of

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century (Gulløv 2000). It is thought that the Thule culture reached its height in the 13th century.

Greenland.[68] Compared to West Greenland, which had contact with European whalers and missionaries in the 17th century, Avanersuaq had been isolated from other places, both within and outside Greenland.[69] During the period between the 17th and the 19th centuries, Avanersuaq was significantly impacted by the cooler post-mediaeval climate. This so-called "Little Ice Age" caused the Thule culture to decline. By the early 19th century, Inughuit (people of Avanersuaq, previously called Polar Eskimos) no longer used the kayak, bow and arrow, fish spear, and other important items of Thule technology, and this greatly compromised their economic efficiency (McGhee 1994:568). When Scottish explorer John Ross "discovered" Inuit living at such high latitudes in 1818, the local population had already dwindled. The last emigration, which occurred in the 1860s from Baffin Island of Canada, reintroduced technology, such as the kayak, which may have stopped the decline of the population of Avanersuaq. In the beginning of the 20th century, Avanersuaq finally came under the sway of Denmark. Incidentally, Greenland was granted Home Rule (an autonomous government with Danish control) in 1979, and was later granted additional control in 2009. Consequently, the Home Rule government changed its name to Self-Government. Greenland remains part of the Danish Kingdom with Danish block grants constituting more than two thirds of its budget

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[68] In this paper, some Greenlandic words are spelled in North Greenlandic while others in West Greenlandic. As for spellings of North Greenlandic words, I referred to Fortescue (1991), but there are some words spelled just as I heard them. North Greenlandic is distinctively different from West Greenlandic. One of the big differences is that North Greenlandic replaces the "s" sound with the "h" one.

[69] It can be said that Danish colonization started from 1776, when Denmark shut down the entire coast of Greenland to foreign ships, and succeeded in establishing a monopoly over all trade in Greenland through the Royal Greenland Trade Company (Dan. *Den Kongelige Grønlandske Handel*, KGH) (Caulfield 1997:30). Denmark's trade monopoly brought much influences to western Greenland, such as material culture including flour, rice, coffee, sugar, and Christianity. The use of rifles for hunting started around this period.

revenue.

Seasonality in the 1970s-80s

Based on the existing literature on climate conditions and animal migration patterns, I reconstruct the seasonality of the past. This is the preparation for the comparison with the current climate conditions for discussion.

Seasonality

As an example of past climate conditions, I describe the seasonal cycle in Siorapaluk in 1976–77 (Iwashita 1977). The winter accounts for a large portion of the year, with the summer being almost two months long.[70] At the end of August, the temperature starts to decline and the days become increasingly shorter (cf. Figure 9-1). The autumn may be considered as merely the short period just before the formation of new ice and before the disappearance of sunlight. The ground starts to freeze in the middle of September, with the snow that falls at the end of September remaining until the next spring. In October, a thin film of ice starts to form along the shores, and flat, round pieces of ice start to appear floating in the ocean. In the middle of October, it is too dangerous to use a boat for hunting because ice flakes on the sea become thicker, and on October 25, the sunlight disappears (Figure 9-1). The movement of the waves and tide repeatedly impede the formation of sea ice, but by the middle of November, ice covers Robertson Fjord (the fjord of Siorapaluk). The dark season (or "polar night") continues for about four months. On February 17, the sunlight returns, and in the end of April, the offshore sea ice begins breaking up. In the middle of June, the ice on the ground disappears

[70] The Greenlandic word for winter is *ukioq*, which also means a year.

entirely. Robertson Fjord opens up, but is still covered by many large ice blocks. In the beginning of July, pieces of sea ice begin to be driven outward by a current from the bottom of the fjord, and the sea becomes ice free in just a few days.

Animal migration

Tens of thousands of *appaliarsuk* (Gl., guillemots, *Alle alle*) arrive from the middle to the end of May for nest building. Scree cliffs, just two kilometres west of the settlement near the end of Robertson Fjord, are

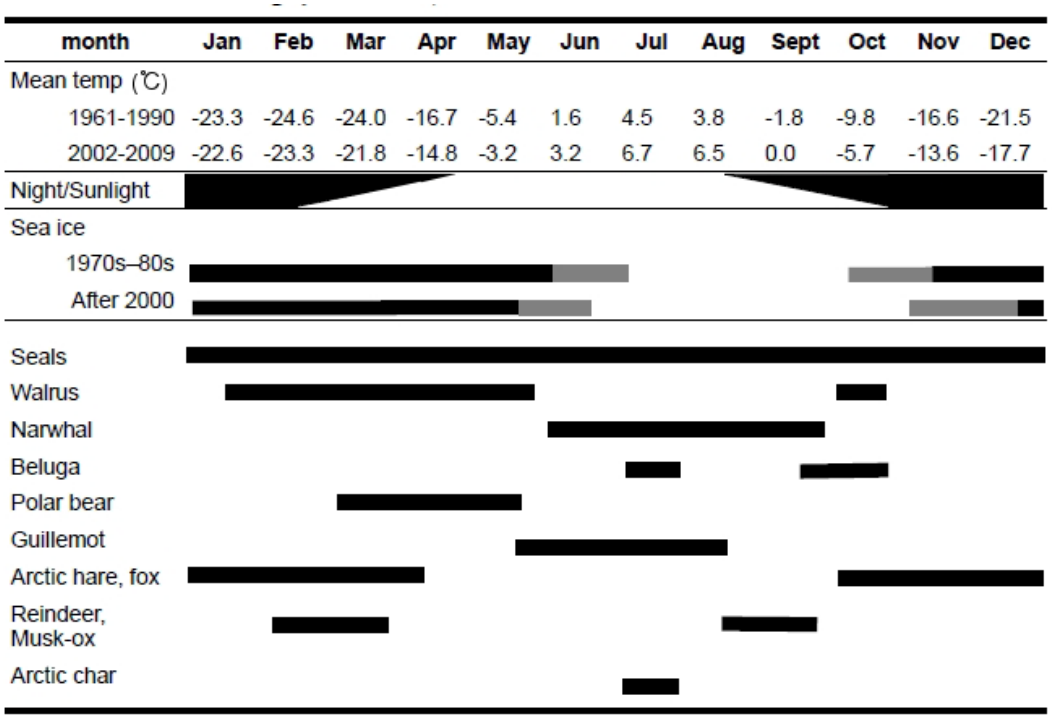

Figure 9-1. Seasonal hunting cycle in Siorapaluk

Mean temperatures are based on data from *Danmarks Meteorologiske Institut* (Danish Meteorological Institute, DMI n.d.). This table is made for visualization purposes only. The period of hunting each animal species varies yearly.

their nesting ground.[71] Lagging behind the guillemots, the seagull (*naaja*) and eider (*miteq*; *Somateria mollissima*) also lay eggs in their nests. From the middle until the end of August, guillemots fly back to the south with their young.

Generally, narwhals, belugas, and walruses move northward before the summertime and southward before the winter. Narwhals are generally present throughout the entire Thule area (Lykke Thomsen 1993), but do not enter Robertson Fjord where the water is too shallow for Greenland halibut – the narwhal's prey. In the summertime (July and August), narwhals enter Inglefield Bredning (the fjord of Qaanaaq) to eat halibut on the sea bed. The migration routes of narwhal are still unclear, but by and large, before sea ice forms, some group of narwhals leave coastal areas and migrate towards Baffin Bay by mid-November (Heide-Jørgensen and Laidre 2006). Belugas by nature take a migration route along the shorelines. There are years when the fjord of Siorapaluk is crowed with hundreds of belugas in October, when the sea is about to freeze over, as well as in July, when the sea becomes open again (Ôshima 1989:170–171). Sometimes a pack of belugas will come into the fjord in order to shelter themselves from the rough sea and from killer whales. Walruses are abundant off Siorapaluk, finding plenty of mussels to prey on.

Sense of seasonality

People's sense of seasonality is closely related to change in the physical environment and to animal migration patterns. For example, Jean Malaurie documents almanac-like sayings of local inhabitants:

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[71] Guillemots make their nests in the upper parts of the cliffs, between rocks. A pair of guillemots have one blue egg in the middle of June in their nest (Ôshima 1989:161–166).

> January is *Qaammaliaq* (when the month of the moon); February is *Seqinniak* (when the sun appears); May is *Appaliarsuit tikitaafiat* (when many guillemots arrive); September is *Tatsit sikutoat* (when the water in the lake freezes); November is *Tutsarfik* (when we listen)." (Malaurie 1982:223 with my corrections).

Through continuous engagement in their landscape, people have accumulated knowledge and understandings about their local environment. This type of knowledge of how things work has been passed down from generation to generation, and has provided a guide for action. With repeated involvement in hunting practices in an appropriate place and time, people have developed a frame of reference, on which community members rely for the validation of their judgements, behaviour, and predictions for future events in their environment (Stevenson 1996; Wenzel 1999; Usher 2000).[72] This type of environmental knowledge, or local knowledge, is shown in the following sections.

Seasonal hunting in the 1970s-80s

I intend to describe patterns of hunting peculiar to Avanersuaq, based on the existing literature on subsistence activities in this area in the past. Again, this is the preparation for the comparison with the

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[72] With reference to his stay in Avanersuaq in 1950–51, Jean Malaurie suggests that local inhabitants move from place to place depending on their purpose for using natural resources, such as bears in Melville Bay; walruses in Neqi-Etah; seals in Savissivik; stones for oil lamps north of Neqi; birds and seals in Siorapaluk; sharks in Kangerluarsuk; birds in Etah and on Kiattaq and Qeqetarsuaq; reindeer in Inuarfissuaq; bears on Humboldt Glacier (Malaurie 1982:439–440). Although the local inhabitants do not exercise their mobility as much as in the 1950s, hunters and their families still move for the purpose of hunting. There are many abandoned small settlements around Siorapaluk, such as Qeqetarsuaq, Anoritooq, and Inuarfissuaq. Some of these sites are still used by hunters as a base camp.

current climate conditions for discussion.

Seal and walrus hunting

The mainstay of traditional food in Avanersuaq has been seals and walruses (Malaurie 1982:94). Seals may be hunted throughout the year, with the ringed seal (*natseq*; *Phoca hispida*) being the most commonly hunted species.[73] The seal hunting seasons can be divided into the open-sea season and the freeze-up season.

During the summer when the sea is open, hunters will go by boat to shoot seals. May is the season when seals begin to moult their furs, and reduce their body fat. If a seal dies instantly when shot, it will sink immediately. The lower salinity of the water at this time of year due to the melting ice and snow accelerates this tendency. Consequently, a hunter will start an outboard motor beforehand and purposefully misses a vital spot on the seal, by shooting the seal's muzzle or its neck. While the seal has fainted, the hunter throws the throttle wide open to catch the seal with a hook before the seal sinks. As is often the case when hunting other species, it is very important to reduce "struck-and-lost" rates for both economic and ecological reasons.

The sealing methods during the freeze-up season include ice-netting, breathing hole sealing, ice edge sealing, and basking seal hunting. In early winter, when the fast ice becomes thick enough to bear a man's weight, hunters begin setting nets (*qassutit*) under the ice at reefs near the shorelines and behind offshore fixed icebergs.

In a different method, they start to hunt for seals that surface at breathing holes (Gl. pl. *allut*). The hunter walks along the lee side of a thinly frozen-over crack (*naggut*) in the ice with sled dogs and spots a

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[73] The West Greenlandic word for seal in general, *puisi*, is synonymous with ringed seal in Avanersuaq.

seal's breathing hole. He lets his dogs pass by the breathing hole and waits for a seal by the side of the breathing hole. When a seal comes up, having sensed that the dogs have gone away, and thus lowering its guard, the hunter shoots it (Ôshima 1989:46). This method of sealing is called *niparneq*, which requires a large amount of patience.

The third method is hunting along the ice edge in early spring (e.g., late April), when the offshore sea ice starts to break up (Ôshima 1989:159). As long as there is ice and water together, this hunting method can be employed all through the year. Seals often stick their heads out near the edge of the ice. Hunters shoot these seals called *nuijaattoq* (see below).[74]

Fourth, also in the springtime, seals bask on the ice in the sun. A basking seal (*uuttoq*, as opposed to *nuijaattoq*) on ice is a hunter's target (Ôshima 1989:49–51). This method is called *uuttuliattoq*.[75] Sometimes, a hunter will crawl on the ice to approach an *uuttoq* seal, using a white screen (*qamutaahat*) to hide himself.

The bearded seal (*ugguk* or *ussuk*; *Ergnatus barbatus*) is valued by hunters for its hard and thick skin, which is suitable for making whips for sled dogs, ropes for hunting, and soles for kamiks. Harp seal (*aataaq*; *Phoca groenlandica*) skin is sold at a higher price than that of the ringed seal.

Walruses can be hunted from the middle of January onward, but their full-scale hunting season starts in February (Ôshima 1989:182–185). In this period of time, sea ice near the shoreline of the settlement is still over one meter thick. Since walruses, as well as seals, cannot keep their breathing holes in the ice open, when the ice is over 20 centimetres thick, they move further away from the

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74 This term is derived from *nuivoq* (come out, appear).

75 Dahl (2000:144–154) states similar explanations for sealing with ice-nets and hunting *uuttoq*.

settlement. Accordingly, walrus hunting starts approximately 50 kilometres west of the settlement, where, since the sea ice is always broken due to the movement of currents, walruses are able to keep their breathing holes wide enough (about 20 to 30 centimetres across) while preying on mussels on the seabed. Once the hunter spots a walrus' breathing hole, he waits for walrus to surface for a breath. Because a killed walrus will sink immediately, the hunter is required to thrust a harpoon into the walrus' neck to secure the animal.[76] This type of hunting is called *sikumik aivannianneq*.[77] Since this type of hunting trip entails long-distant transportation by dog sled, it requires several nights of camping. As the sea ice continually breaks up, the hunting ground will move closer to the settlement. Accordingly, a base camp will move southward from Aunnartoq, to Anoritooq, Etah, and to Neqi, where a shack is located.

The words *nuijaattoq* and *uuttoq* are also used for walruses, and the hunting of these types of walruses is carried out in the same time period as sealing.[78] In the case of *uuttoq* walrus hunting in May, when the offshore sea is open, hunters carry a motor boat by dog sled to the edge of the ice and then go offshore by boat to search for walruses on the ice (Ôshima 1989:160). Only in this case, may hunters shoot walruses to death instantly because they are on the ice

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[76] Once the head (*hakkoq*) of the harpoon (*unaaq*, approximately from 2.0 to 2.5 metres long) is buried into the animal's flesh, it separates from the body of the harpoon. The head is tied with a rope, the other end of which has a small loop. The hunter passes an ice pick (*tooq*, about 1.0 meter long) through the loop and fixes it on the ice. He holds the ice pick, securing the walrus and waits for the animal to surface again. Then, he kills the walrus, either by shooting or by thrusting a knife (*akuiraq*), which is attached to the end of a stick, into its lungs (Ôshima 1989:74–76).

[77] Walrus hunting with a boat is simply called *aivannianneq*. The word sikumik, in this case, means "on the ice."

[78] In the case of *nuijaattoq* walrus hunting along the ice edge, the hunters lie on the ice, mimicking the behaviour of a walrus in order to attract walruses passing nearby. Hunters make sounds as if several walruses are grunting on the ice, tapping, and poking with each other's tusks. A walrus surfacing near the ice edge (*nuijaattoq*), attracted by the sounds, is to be hunted (Ôshima 1989: 159–160).

and will not sink in the water. The walrus also seasonally migrates. Walrus hunting in the springtime continues until walruses have moved north. In October, just before the sea is frozen over, hunters can also hunt walruses by boat, as they migrate southward.

Other hunting and subsistence activities

Other kinds of hunting and subsistence activities are shown in Figure 9-1. Polar bears are hunted mostly between March and May although the hunting season is open almost throughout the year, except for the months of July and August. This is because polar bear hunting is carried out exclusively by dog sled, with the exception of accidental encounters (Rosing-Asvid 2002).[79] For example, hunters in the northern part of Avanersuaq travel on ice, passing by Smith Sound, further to the northern edge of the North Water polynya, which is the open water area surrounded by ice, in Kane Basin (Ôshima 1989:151). A hunting trip might take a month or so. Polar bear hunting has a special status in terms of socio-cultural values (Born 2008). Bear skins are indispensable for making hunters' outer pants.

As the *uuttoq* hunting season draws to an end, the guillemot (*appaliarsuk*) catching season starts.[80] The guillemot is highly valued by local people. While some of the fresh guillemots are eaten by boiling (*amili*), many of the catch are saved for the winter as *kiviaq*.[81]

Some hunters hunt narwhal at the northern edge the North

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[79] It is forbidden to use snowmobiles for polar bear hunting throughout Greenland in order to lower hunting intensity. At the same time, it can be thought that this regulation preserves a symbolic significance of dog sleds. The Greenlandic word for 'going hunting by dog sled' *qimussijaattoq* also means 'going bear hunting.'

[80] The guillemot, by nature, circles around a nesting ground (a scree cliff) towards the windward side. Men hide themselves behind rocks on the slope and catch guillemots skimming over the surface of the slope with a scoop net. An experienced hunter can catch two hundred per hour (Ôshima 1989:161–164).

[81] *Kiviaq* is guillemot pickled in blubber. Entire birds are left to ferment in a ringed sealskin where the blubber is still attached.

Water polynya, staying there from June through the middle of July (Ôshima 1989:167), but narwhal hunting takes place mostly in Inglefield Bredning and Hvalsund during the period between June and August (Lykke Thomsen 1993:78). Municipal bylaws strictly prohibit hunting of narwhals from motorized vessels in these fjords, and hunters have to use kayaks to approach narwhals. Further, it is required to harpoon narwhals before shooting, except for hunting from the edge of the ice or in the case of limited visibility due to weather (Lykke Thomsen 1993:84). On the other hand, the utilization of motorized vessels and riffles are permitted for beluga hunting, except for the general restrictions placed on the utilization of motorized vessels in certain areas (Lykke Thomsen 1993:43).[82] Beluga hunting is sparse in May and June, but it is more concentrated in September and October, when belugas move southward. For both narwhal and beluga hunting, the use of nets is allowed outside of a defined area from September 1st until the freeze-up. Belugas are not as prevalent as narwhals in this district and hunters do not seem to have as much of an interest in them as they do in narwhals (Lykke Thomsen 1993:38). Yet, both the narwhal and beluga skins are called *mattak*, and are highly valued traditional foods.

Reindeer hunting takes place in the end of the summer. While it does take place in the vicinity of settlements (Prudhoe Land), some hunters go further north to Inglefield Land, such as Etah near Humboldt glacier. In the freeze-up season, Inglefield Land can be reached by dog sled through sea ice along the shorelines or from over the ice sheet at one thousand metres from the sea. Incidentally, musk-oxen have been newly introduced to this area, and musk-ox

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[82] Belugas are mostly hunted from dinghies and motorboats because it is difficult and dangerous to approach them by kayak. Belugas are so aggressive that they will attempt to bite vessels in order to defend themselves.

hunting has only a decade of history. The open season for reindeer hunting (and musk-ox hunting as well today) has been established by the Greenlandic Government as being between August 1st and April 30th.

Small animals, such as Arctic hares and ptarmigans, are thought to be preys for elderly hunters, but younger hunters still partake of these. As the sun disappears, Arctic hares and foxes are caught by traps (starting in the end of October), with these furs being used for making clothes, mittens, and kamiks (Ôshima 1989:179–182). Arctic char (*eqaluk*) come down from an inland lake in late June and stay in the fjord until the middle of August. Arctic char can be caught by nets set up along the shorelines (Ôshima 1989:203–204). However, since hunting is highly valued in this society, fishing is carried out in hunters' leisure time. Children and old women prefer to do berry-picking in September and ice-fishing in the winter.

Overall, this section illustrates a wide variety of the local inhabitants' subsistence strategies. They have several options to choose from with reference to weather, time, and feasibility. In order to acquire knowledge, skills, and techniques necessary for these activities, one needs long-term experience in the environment. It typically takes ten to fifteen years to become a hunter.

Incidentally, no ritual practices or ritual offerings concerning hunting were directly observed. It is said that hunters once observed hunting rituals, such as laying a dead seal down on the sea ice and directing its muzzle towards the breathing hole where it was killed. However, I was told that it has been a long time since this kind of ritual was practiced. (Similar rituals existed in various parts of Greenland as a show of respect. See Lynge [2005].) One of the reasons for this may be the spread of epidemic diseases in this area that killed many elderly around the turn of the 20th century, who

could have been the conveyors of the procedure for hunting rituals to the next generations. However, it seems that hunters have some feelings towards nature in the inner part of their mentality, such as an understanding that nature is something that is likely not manageable by humans, but at the same time, provides its bounty to them.

Hunting conditions after 2000

From what I heard from local hunters, I intend to describe how a situation surrounding hunting has change with reference to past climate conditions and animal behaviour.

Unstable sea ice

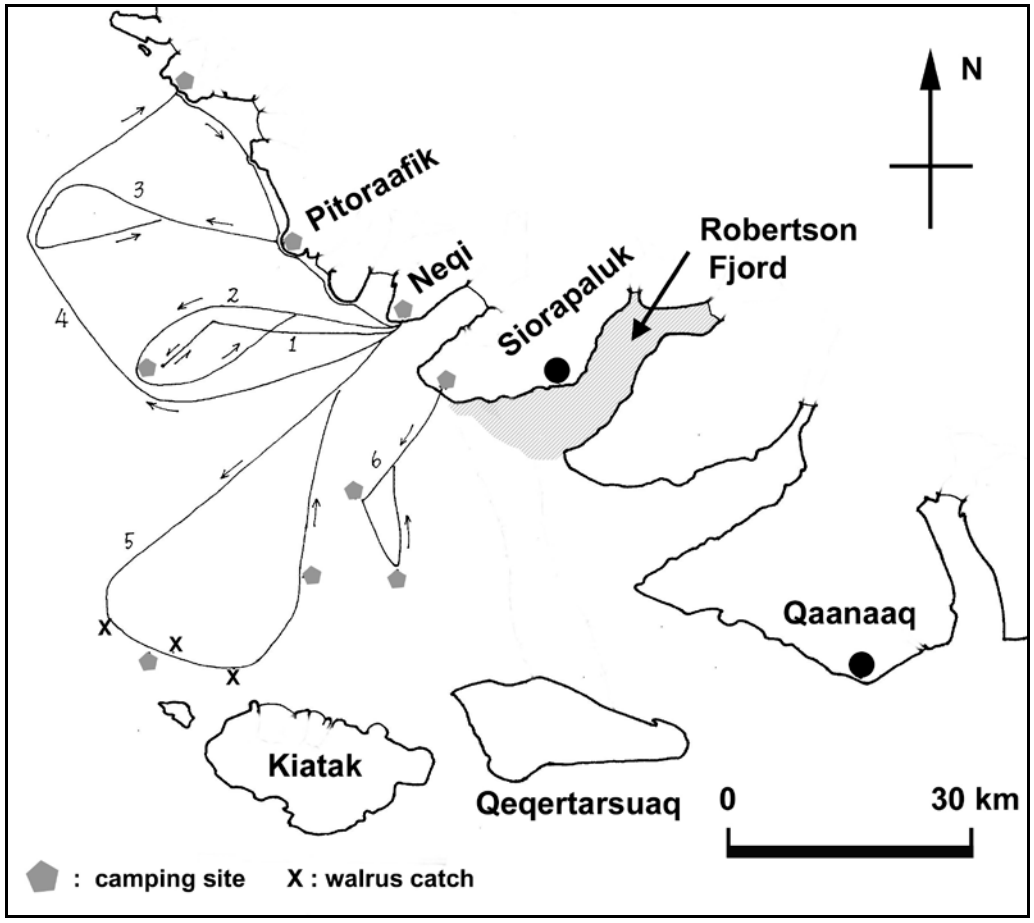
One of the most significant changes is the late freeze-up and early thaw. Many interviewees mentioned to me that changes became conspicuous around 2000, grounding their observations in their memories of the 1980s. Compare, for example, the average temperatures between 1961 and 1990 and ones between 2002 and 2009 (Figure 9-1). In the past decade, it has most often been the case that the sea ice did not form until December but the sea ice now breaks up earlier than before (Figure 9-1). In addition, the newly-formed sea ice tends to be broken more easily. These changes immediately make the winter hunting period shorter, travel on ice dangerous, and access to living resources difficult.

Currently, compared to other traditional methods, ice-netting is the primary method for sealing during the polar night season (cf. Hansen 2008:152–153). Since it is too dark to aim at seals from a distance, using rifles is not an alternative. It is from March onward that rifles are usable for hunting. As a result, the number of ringed

seals killed by ice-nets in northern Greenland accounts for about two thirds of the total catch (Greenland Home Rule Government 2009). Compared to the 1980s, when the fast ice was formed by the middle of November, the start of the full-fledged ice-netting season is now delayed by one month or more. Even after December when the sea ice is formed, it is only within the fjord of Robertson Bay that stable sea ice has been found in recent years. Consequently, places where hunters can set ice-nets or employ breathing hole sealing are confined to the fjord (Map 9-2).

The unstable sea ice and early thaw in recent years have also been detrimental to walrus hunting. This becomes obvious with reference to the fact that during the period between early February and the middle May of 1976, hunters carried out walrus hunting trips at least six times on the ice outside of Robertson Bay (Iwashita 1978; Map 9-2), and the sixth hunting trip was made on ice approximately 7.5 kilometres off Siorapaluk in the middle of May. In contrast, in the beginning of May 2009, the water was already open at approximately 5.0 kilometres from the settlement. Stable sea ice is critical to walrus hunting. A full-grown male normally weighs approximately 1,200 kilograms, and the females around 800 kilograms (Born 2005). In order to haul walruses onto the ice, the ice must be able to hold this weight, and the hunters' weights as well. Since the sea ice, as mentioned above, has been unstable outside the fjord in recent years, it has not been possible to carry out this type of walrus hunting, which requires long-term camping trips outside the fjord, except during an occasional cold spell. This, together with the fact that offshore sea freezes later (at least after December) and that the sea ice breaks up earlier, has remarkably reduced the walrus hunting period from several months to a few months or even one month in some years.

Unstable sea ice conditions have impacted travel safety and have restricted a hunter's sphere of activity. Previously, it was possible to dog-sled from November to June, or even from October to July in some years, but currently, hunters cannot use dog sleds from May to



Map 9-2. Walrus hunting trips carried out outside the fjord of Siorapaluk in the winter of 1976

Trip 1, Feb. 12-14; trip 2, Mar. 13-14; trip 3, Mar. 25-27; trip 4, Apr. 2-3; trip 5, Apr. 4-6; trip 6, May 18-21. Currently, the stable sea ice during the winter is found only within the fjord (the shaded part). Therefore, in recent years, it has not been possible to carry out a long-term hunting trip outside of the fjord, such as ones conducted in 1976.
(NB. The area with stable sea ice is shown only in the vicinity of Siorapaluk. Other areas such as Qaanaaq are dealt with in this map.)
Source: Iwashita (1978)

December. Even in the wintertime, travelling now requires more caution than before. In March 2008, hunters had to go over the inland ice to hunt reindeer in Etah, which could have been reached on fast ice along the shorelines if the ice had been sufficiently stable. Also, it was possible to go across Smith Sound by dog sled until around 1990 (Takeda 2008), but the recent thinner sea ice has deterred the hunters' attempts.

As a result, access to living resources is impeded by the time constraints and limitation of hunting activities. It is too dangerous to go hunting offshore in recent ice conditions during the wintertime. For example, it was a concern of the hunters that nets set up under the unstable ice between Robertson Fjord and the islands of Qeqertarsuaq and Kiatak, where icebergs often pass, were most likely to flow away. Nowadays, since it is even dangerous to approach such an area, such concerns are irrelevant. At best, hunters could only set nets under fast ice in shallow water (i.e., within the fjord). Poor accessibility to living resources will have a direct impact on a hunter's revenue since hunters earn money by selling sealskin.

Another consequence is the difficulty of keeping their sled dogs. In order to keep dogs, hunters must secure food for the dogs in addition to their own families' food. Malaurie (1982:438) calculates that a hunter needed at least 50 ringed seals a year in 1950 in order to feed ten dogs and his family, even taking into account having hunted other animals, such as walrus, beluga and so forth. Particularly, walrus hunting is indispensable to keeping dogs.

Animal migration

Hunters are also aware that the behaviour of marine and land animals has changed in the past decade. For example, reindeer and polar

bears were once found in more northerly places, such as Etah, but they began to appear in more southern areas near settlements (Jennings n.d.). Near Qaanaaq, land animals are found up to the mountains, and those, such as musk-oxen and Arctic hare for example, are competing for habitat. Walruses are found closer to the settlement of Siorapaluk than before but tend to move northward earlier than before. Some interviewees expressed similar observations. Presumably they exchange information and sentiments based on their observation on a daily basis.

Discussion: coping strategies and their hindrances

With the wider social, political, economic context, I aim to address issues concerning the difficulty for hunters in developing coping responses and strategies.

Coping strategies

The coping strategy at the individual level is mainly based on flexibility, such as hunting alternate animal species, the adjustment of transportation routes, and the modification of hunting methods. For example, when walrus hunting becomes difficult or impossible in the wintertime because of unstable offshore sea ice, an alternative would be to catch seals with ice-nets along the shorelines. The seals come closer to the shorelines of the settlement than walrus do, especially since the water is warmer these days (Malin Jennings, per. comm.). Since the sea ice within the fjord is stable, hunters can combine ice-netting with the breathing hole sealing (*nipparneq*) in the fjord. Doing so can save hunters from needing to go to the edge of the thinning offshore sea ice. This kind of psychological flexibility has

been in the scope of an Inuit tradition. Another example is to switch their target animals from marine mammals to terrestrial animals, such as the Arctic hare, fox, and ptarmigan in the proximity of the settlements, and musk-oxen in Inglefield Land over the inland ice.

Second, vigilant hunters adjust their transportation routes depending on the ice and snow conditions. In order to avoid unstable fast ice, they utilize inland routes, such as the inland ice sheet to the north and mountain passes to the south.

Third, the modification of hunting methods is imperative under some restrictive situations. As mentioned above, nowadays it is difficult or impossible to go offshore to hunt walrus in the wintertime. Rather than sticking to hunting on the ice (*sikumik aivannianneq*) in the wintertime, hunters have decided to carry out walrus hunting by boat in the springtime, when *uuttoq* (walrus on the ice) are found, and in the autumn when walruses start to migrate southward.

As for sealing, historically speaking, ice-netting was not available in Avanersuaq until the 1920s, when Europeans introduced it. The winter was the season of scarce food. Particularly, February and March were hardship months when very poor families ate nothing but fermented guillemots (*kiviaq*) for weeks at a time (Malaurie 1982:93). Therefore, the use of nets is an example of the adoption of new technology among Greenlanders.

Decision-making and the exercise of flexibility are made possible by each hunter's knowledge about the environment they are engaged with on a daily basis, their long-term experience, and the techniques they have acquired through their experiences. If this type of knowledge and experience is called human capital, then a living resource management regime based on locally agreed-upon informal and formal rules can be thought of as social capital (Adger 2003; Pretty 2003). These resource management rules may not be an immediate

product of environmental change, but are rather long-standing practices; however, they are important institutions for coping with change. These rules and regulations are examples of coping strategies at the regional level.

As mentioned above, when hunting narwhal in certain fjords, hunters are required by municipal bylaws to use traditional technologies, such as kayaks, harpoons, and single-loaders. Narwhals may be chased by motorized vessels, but this sensitive animal would keep away from the fjords if hunters were to do so. Many hunters think that the noise from motorized vessels is a source of disturbances and deters narwhals from entering the fjords (Lykke Thomsen 1993:85). In addition, it is widely accepted in this district that harpooning narwhals before killing them is a superior way of securing killed animals before they sink as well as to avoid scaring nearby animals (Lykke Thomsen 1993:84). These regulations help not only to keep narwhals undisturbed, but also help to manage the local narwhal populations.[83]

Another example of using older, traditional technologies is a municipal bylaw that prohibits the use of snowmobiles for hunting purposes from January until May. This bylaw serves to protect the local animal populations, but it seems that there are more practical reasons for this restriction. Dogs are able to pick up on the scent of animals, such as polar bears, seal's breathing holes, and so forth. In addition, there are no concerns about mechanical difficulties as might occur with a snowmobile. Dogs are also able to detect danger such as cracks and water puddles on the ice although there are still situations

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[83] Compared to formally institutionalized rules, there are tacit agreements among local hunters. For example, Hunters in the northern part of Avanersuaq (Siorapaluk, Qaanaaq, Qeqertaq) go north for polar bear hunting, while hunters in the southern side (Mariusaq and Savissivik) go south to Melville Bay (Jennings n.d.). This way, local hunters can avoid crowding in a specific place, and this l also serves to regulate the animal populations.

in which a hunter must force the dogs to go over a dangerous spot to avoid a bad situation for both the hunter and the dogs.

On the other hand, there is an example in favour of modern technologies. Previously, hunters were not allowed to use motorized vessels until the middle of May, when the sea became open, in order to keep walruses closer to the fjord. However, since walruses tend to move northward earlier than before due to the recent environment change, hunters petitioned the municipality to change the bylaw. In 2009, the use of motorized vessels was allowed all year. This change facilitates hunting *uuttoq* walruses, giving the hunters a head-start, so that they can hunt walruses leaving earlier than before. In this respect, a local hunters' association played an important role.

At a higher level, the government took a measure to diversify local hunters' hunting strategies. In 1986, musk-oxen were re-introduced to Avanersuaq (14 to Inglefield Land, six to MacCormick Fjord, and seven to Kap Atholl) after their extinction in the 1870s (Born et al. 1998:43). After a decade of protection, musk-ox hunting became open as a result of the research collaboration of biologists and local hunters (Landa et al 2000). Reindeer were also introduced to the Olrik Fjord (the south side of Inglefield Bredning) area. The stocks of these land animals will offer options for local hunters in the future, when it becomes more difficult to hunt marine animals. In addition, the Greenlandic government regulates several animal species with the introduction of the licence system. For example, it offers two types of hunting licences, occupational and recreational, for Greenland's inhabitants. Polar bears and walruses, for example, are exclusively hunted by occupational hunters (Greenland Home Rule Government 2008).

Hindrances to coping with change

Whether hunters can successfully cope with climate change and variability and subsequent difficulties largely depends on how they can secure access to living resources. In this respect, the re-introduction of musk-oxen to this district will help hunters increase their hunting options. At the same time, however, it is true that the government's restrictions concerning where, when and who can hunt, and how much, have become a burden to local hunters. In other words, the hunters' coping strategies are carried out under the power of larger forces that constrain or even nullify the hunters' effort to cope with climate change. This section considers how the government's policy is not in harmony with the hunters' coping processes, and considers how international affairs and the global economy impact the Greenlandic government's policy.

The hunters' chief frustrations are the levels of quotas and the way the government establishes these. Currently, quotas are set on most of the species that occupational hunters regularly hunt, which until recently were not regulated. The introduction of these regulations were consequences of international pressures, such as international and/or regional nongovernmental organizations like the North Atlantic Marine Mammal Commission (hereinafter NAMMCO) in the case of narwhal hunting (NAMMCO 2005), and the International Union for Conservation of Nature (IUCN) in the case of polar bear hunting (Fikkan et. al 1993:105). Local hunters feel the levels of these quotas are too low, yet due to recent negative consequences of climate change, their catches cannot even reach the levels of the set quotas (Table 9-1).

Table 9-1 Quotas and catches of animals between 2008 and 2009

	Reindeer			**Musk-ox**		**Polar bear**	
Area	Inglefield Land	Prudhoe Land	Olrik Fjord	Inglefield Land	Kap Atholl	Qaanaaq	Savissivik
Quota	90	90	No Quota	30	15	8	18
Catch	17	10	15	11	2	5	14

(Continued)

	Walrus	**Narwhal**	**Beluga**
Area	Avanersuaq	Avaersuaq	Avanersuaq
Quota	70	109	76
Catch	53	90	49

Source: Response from the Commune of Qaanaaq (dated August 2010) in response to my inquiry

In the severity of the current situation, *sassat* is a fortunate phenomenon for local hunters.[84] Narwhals and belugas trapped in the ice fall outside the government regulations, and the authorities allow all licenced hunters to haul animals regardless of the remaining quotas. This shows an extent of latitude within the set quotas. In effect, when *sassat* occurred in November 2009, mainly Qaanaaq hunters were able to procure more than forty belugas and narwhals (Olsen 2009). Nevertheless, the reason why the local hunters are frustrated is because the quotas are set by scientific initiatives and by the government, with little input from local hunters, nor with consideration of the locally established rules (for a similar discussion,

[84] *Sassat* is a North Greenlandic term, pronounced like "ha-sher," refers to "whales trapped in the ice." Hundreds of belugas and narwhals are trapped in the ice when the temperature suddenly drops. This occurs very seldomly. It was for the first time in 20 years that sassat occurred in November 2009 (Olson 2009). Following that, sassat occurred again in February 2010.

see Sejersen 2004b).[85]

The imposition of the quota system is even detrimental to walrus hunting. When I interviewed local hunters in 2009, they hunted one or two walruses a year, fewer than in earlier years. This may be partly because of environmental change, but may rather be because of the introduction of quota systems by the Greenlandic government. In 2009, the quota was two walruses per hunter. In the fall of 2010, the quota was further reduced to one walrus per hunter. As written above, a walrus provides plenty of meat, and the reduced walrus quota may bring about a concern among local hunters about being unable to secure enough food for their sled dogs. Despite this concern, processed dog foods will not be provided by government.

In Siorapaluk, the restriction may create another concern among local hunters. Originally, Siorapaluk and the area north of it were places abundant in walruses. Walruses are predators of seals. Since walruses now approach Siorapaluk closer than they did previously, this may cause a decline in the seal catch.

The top-down nature of the government's decision-making is also illustrated in their establishment of a protected area without understanding or considering the local sociocultural context. During the 1980s, the government decided to close down the eastern half of Inglefield Land to reindeer hunting. In 1999, the reindeer population was estimated at over two thousand, and since then, no population survey seems to have been carried out. Although local hunters argue that there has been an upward trend in the reindeer population

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[85] For example, when the Greenlandic government undertook a series of surveys of guillemot (*appaliarsuk*) populations under an international cooperative scientific research program of the Conservation of Arctic Flora and Fauna (CAFF) (Falk and Kammp 1998), local hunters increased their suspicions of biologists because of the apparent abundance from a local inhabitant's point of view and because of the sociocultural value of fermented guillemot (*kiviaq*). *Kiviaq* is offered on both special and ordinary occasions in the community and had been an important source of nutrition in winters long ago (e.g., Malaurie 1982).

(Cuyler and Witting 2005, 2006), the eastern half of the area has remained closed. This protected area includes traditional hunting and camping grounds such as Inuarfissuaq and Qaqqaitsoq. Previously, Siorapaluk hunters used to make hunting trips based in these camp sites in the end of summer and coming back in early winter. An archaeological survey shows that Inuit Greenlanders had been continuously using the same hunting sites since the prehistoric era (Darwent et al. 2007), which suggests Greenlanders' strong affection for the sites. However, the establishment of the protected area not only took away hunting grounds from hunters, but has also rendered obsolete a long-standing hunting practice. Only hunters in their forties and older know the dog-sledding routes over the inland ice to the hunting grounds. This will translate into an accelerated loss of mobility for hunters who used to travel over a wider landscape.

In addition, local hunters began to observe an increasing frequency of wolves' footprints on the inland ice and in Inglefield Land. Thought to be migrating from Canada, an increase in the wolf population is expected to bring about negative impacts on hunting. However, in spite of local hunters' requests, a hunting ban on wolves is currently in effect. As wolves keep away from signs of human activity, the wolf population would not have increased if local hunters had been able to hunt freely in Inglefield Land.

Incidentally, a mining company conducted aerial surveys in Inglefield Land in summer 2010 in order to define drill targets for a magnetic anomaly that is speculated to stretch approximately 80 kilometres long under the ground (GEUS 2010). The survey was carried out without any consideration about the impact of the noise from aircrafts on animals.

There is also a problem with the way the local government distributes reindeer and musk-ox quotas. Both occupational and

recreational hunters can participate in a hunting quota lottery, but the quota allocated to recreational hunters who may not actually go hunting, do not have equipment, or do not have the skills and knowledge necessary for hunting, will be unused (for similar discussion, see Sejersen 2004a).[86] Accordingly, annual catches of reindeer and musk-ox ended up not reaching the permitted levels.

Furthermore, recent animal rights campaigns in Europe have made it difficult for Greenlandic hunters to even earn money by selling sealskin and fur (cf. Wenzel 1991; Freeman 1997). As a result, the government-owned tanning factory does not purchase as much sealskin from hunters as it did before.[87] More recently, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) decided to prohibit the export of narwhal tusk. In order to supplement their income, some hunters decided to engage in alternate means of income to supplement for poor harvest, such as running an inn for tourists (Jennings n.d.) and selling value-added sealskins and fur.

Concluding remarks: the clash of ways for opening up the future

In this chapter, while comparing to a past seasonal cycle of hunting in Siorapaluk, northern Greenland, which I illustrated with reference to the existing literature, I discussed, based on my own fieldwork, how

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[86] Lotteries for reindeer and musk-ox quotas take place in the end of July and January. The first lottery is for hunting by boat during the summertime (from August onward), and the second one is for hunting by dog sled during the winter (from February onward).

[87] Sealskin are sent to a national tannery in south Greenland from locally-distributed trading posts. Despite 270 thousand unsold stocks, as of September 2010 (Hansen Magnussen 2010), this national tannery purchases sealskin from hunters throughout Greenland, this system serves to protect hunters' lives, and the payment that hunters receive is virtually a subsidy for them.

local hunters currently cope with the consequences of recent climate change and variability.

From an immediate point of view, how they can secure access to living resources and travel safety are important matters for hunters to cope successfully with climate change and its subsequent difficulties. At the individual level, hunters are coping by switching the animal species they hunt, adjusting transportation routes, and modifying their hunting methods. Although they no longer have the high degree of mobility they once had, the people's flexibility, psychological or physical, is a key in their successful coping strategies. Part of this flexibility is backed by their breadth of environmental understanding and knowledge, with which they can validate their judgements and course of action, and with which they can foresee events that are likely to happen in a shifting landscape. At the local level, the mutually agreed-upon rules concerning hunting methods are established based on the collective understanding and knowledge of the local environment. These help regulate local animal populations, which eventually make available a variety of options for hunters to cope with change. We can view these kinds of knowledge and social and economic ties as a source of social capital, which facilitates the sharing of information, the sharing of awareness of environmental risks, and a means for reciprocal relations to deal with environmental change (Adger 2003; Adger et al. 2005).

As pointed out elsewhere, local coping strategies would work well if included in regional or national institutions and systems, such as a government-level resource management regime (Smit and Wandel 2006; Adger et al. 2007). Conversely, larger political, economic forces surrounding the locality may hamper each hunter's coping effort and impair the effectiveness of the mutually agreed-upon resource management system. Therefore, it is important to examine local

initiatives to cope with climate change from a broader point of view. In Avanersuaq, whether hunters can successfully cope with climatic and environmental change largely depends on whether locals can muster a higher level of political, organizational support and on whether they can deal with larger forces surrounding the locality. This is because it seems to me that hunters in Avanersuaq have tried everything they should think of to secure their livelihoods.

In order to cope with the broader forces, such as the anti-fur campaigns in Europe and growing economic globalization, international organizations representing their interests may play an important role, just like the Inuit Circumpolar Council (ICC) does. However, it should be noted that there is a chasm between the local and governmental levels because the government fails to intervene within the local sociocultural context.

I stated in Chapter 4 that Greenland needs to promote its economy in order to financially manage the domestic areas of its affairs, the responsibilities of which were transferred when the current Self Government was initiated. Currently, Greenland government is eager to diversify its economy from one heavily dependent upon block grants from Denmark to a large-scale natural resource development such as oil and gas extraction.[88] Politicians are highly motivated to pursue a higher level of self-governance, and some of them believe Greenland can ultimately achieve independence from Denmark. Greenlanders have formed self-identity with reference to the existence of Danes in their land, and for them, the idea of "desirable" development is equated with guiding their own future by moving away from Danish control

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[88] In late September, Cairn Energy, a Scottish oil producer, announced that it had found evidence of oil off the coast of Greenland, which is first time ever since oil and gas exploration had begun (Wood 2010). However, as of the end of the 2011 exploitation season, it still remains unable to find a large deposit of petroleum (Kumar 2011).

and the creation of Greenlandicness (Sejersen 2004b; Gad 2009). This sentiment is well reflected in, for example, the fact that they made Greenlandic an official language in 2009.

However, current government policy may drive settlement people into the extremities. There were political arguments about whether "uneconomical" settlements with a population of less than one hundred should be closed (Sermitsiaq 2009). Even the existing settlements receive unfavourable life line services compared to large towns in terms of prices and convenience. Current circumstances surrounding settlements are serious. As it is – if the government does not support the locals, the locals' effort to open up the future may be discouraged by larger forces surrounding the locality. This is the case in Avanersuaq. When the government envisions what it should be in the future, it should not discourage people in a locality from cultivating the future.

10. One Phenomenon and Manifold Narratives: Different Views of the Future

Allow me to begin this chapter by relating my personal story as an example of what I intend to discuss thematically. Before starting my long-term fieldwork, I carried out preliminary research in Qaqortoq in December 2007. I had little first-hand knowledge or understanding of social and economic life in Greenland, nor of the political context of autonomy that makes Greenland distinctive as an Arctic region. My first interview in Greenland was with an elderly hunter/fisher, who was 66 years old. I explained who I was, why I had come to Greenland, and what kind of things I would like to know. I then asked him whether he had encountered any problems because of climate change.

"No," he said. It was a quick and blunt answer.

For a moment, I was speechless. I had arrived in Greenland having read countless scientific reports and research articles about the impacts of climate change in the Arctic; I had read statements by Inuit leaders from Alaska, Canada and Greenland about the catastrophic threat climate change was having on Inuit hunting and fishing activities; and I had read countless articles by social scientists who had written about the vulnerability and fragility of Arctic communities in the face of climate change (Ford et al. 2006; Krupnik and Jolly 2002; to name but a few). Yet here was an experienced hunter telling me that climate change was possibly not as significant to him as the literature had impressed upon me.

To be fair, minority academic voices had been speaking about understanding climate change in the context of other more

immediately apparent everyday concerns (e.g. Nuttall et al. 2005). Such work has tried consistently to argue that climate change may not be the most important issue affecting everyday life, and, for Greenland, has shown the importance of looking at climate change within the context of many other social, cultural, political and economic trends (e.g. Nuttall 2009).

During my long-term fieldwork, I then talked to many fishers, hunters, sheep farmers, and town people as well, and their answers varied. Some said climate had been warming, emphasizing that their livelihoods were much impacted by it, and others said they had noticed nothing. Many more remarked that climate could be changing but that that is the way it is. Since the first interview with the elderly hunter mentioned above, I had several more opportunities to talk to him at length. He was often around at the wharf, preparing for hunting, or was to be found at the *kalaalimineerniarfik* (the local food market), selling his catch such as seal meat and *appa* (guillemot, *Uria lomvia*). He explained further, that once he almost believed in a warming trend that had been reported in the media, but that he did not believe in it anymore because he was feeling the climate was cooling instead recently. I will touch on this matter later in this chapter.

While carrying out my fieldwork, I began to feel that just writing down what people said and just taking what they said at face value did not help me understand what climate change really meant to Greenlanders. In order to understand better the social implications of climate change, it is important to take into account the everyday situations of those Greenlanders who may or may not be experiencing the impacts of climate change. The purpose of this chapter is to investigate the way Greenlanders narrate climate change by taking into consideration their perception of the environment, social context,

and lifestyle.

Vulnerabilities and adaptive capacity of sheep farmers and hunters

In order to examine the way Greenlanders narrate climate change, I take up three "players" for the sake of argument: sheep farmers, fishers/hunters, and government. Here, for the preparation for the following argument, I organize vulnerabilities and adaptive capacities of sheep farmers in southern Greenland and hunters in northern Greenland. Following the procedure I discussed in Chapter 2, I divide their vulnerabilities and adaptive capacities into local, national, and international levels. Again, I am not satisfied with vulnerability study. The emphasis is not on identifying vulnerabilities and adaptive capacities, but on later discussion beyond vulnerability study.

Vulnerability and adaptive capacity of sheep farmers to social and environmental stresses

I begin with elements that form farmers' vulnerability from the environmental side. In the past, the decisive factor in determining farmers' vulnerability was the temperature during the winter. Up until the middle of the 1970s, sheep were left to graze outside most of the time during the winter months, except for occasional feeding in sheep sheds. As a result, the survival rate of the sheep through the year largely depended on the severity of winters. While mild winters did not affect the number of sheep significantly, many sheep starved to death in harsh winters. This resulted in the fluctuation of the number of sheep that farmers owned. In those days, farmers could not know how many sheep they had until spring. This is reflected by

the fact that farmers were embarrassed when I asked them how many sheep they or their parents had on average in earlier days.

To avoid the disastrous loss of sheep in the wintertime, sheep farmers decided to stable their animals in the sheep sheds in winter months. Many sheep farmers are now able to grasp the number of sheep they own. Some sheep farmers promptly told me the exact numbers of their own sheep, such as 543 and 298. In return, farmers are forced to grow more hay and grains, such as rye, in the summertime in order to secure winter fodder for their animals. Consequently, the weather conditions in summer are more critical than those of the wintertime in deciding today's sheep farmers' vulnerability.

Warming is real. See Figure 8-2 to see that monthly average temperatures have gone up in the last 10 years from 2000 to 2009, by approximately 2° C, compared to the period from 1961 to 1990. If taking only the "average" temperatures into consideration, one can assume a warming trend may bring a positive scenario for sheep farming and crop cultivation in southern Greenland. In effect, one sheep farmer in the Qassiarsuk area mentioned that it was not possible to grow potatoes during the 1960s because of lower temperatures, but that it was now becoming easier. He grew 47 tons of potatoes at his farm in 2007, all of which were sold out domestically (see the third episode of Box 4-4). Some farmers mentioned that birch and willow bushes grew better now, and this was good for sheep in the hills. (Sheep prefer willows to birch.) However, farmers began to experience pest infestation that they had seldom had before, such as mites in the fields and caterpillars on birch bushes (lepidopterous larvae, from my observation).

A closer look further clarifies that circumstances of farmer are not as straightforward as shown in the graph. The temperature is not

the only factor that affects hay production. The amount of precipitation is also important for the growth of hay and grains. I exemplify this. During most of the season, one may find hay bales (ca. 320-360 kg each) stacked on fields and at the corners of the sheep sheds. These are highly visible, and a very good indicator of the weather conditions of the year because it is clearly reflected on the number of bales that a farmer can produce during the summer. Almost all sheep farmers I talked with mentioned a drying trend in recent years, and that this has negatively affected the production of bales. For example, a farmer in the Qassiarsuk area produced approximately 700 bales in 2005, but his yearly bales production decreased to approximately 500 and to 300 in 2007 and in 2008 respectively. A farmer near Qassiarsuk produced over 1,100 bales in 2005 and was able to feed his c. 500 sheep four to five times a day during the wintertime, but he could feed them only twice a day in 2008 because he produced fewer than 500 bales. A farmer from Vatnahverfi precisely remembered the number of bales he yearly produced; namely 639 bales in 2005, 525 in 2006, 443 in 2007, and only 333 in 2008. The relationship between these bad harvests and dry weather conditions can be inferred from Figure 10-1. There were some exceptions, but generally speaking, the majority of farmers had a bad harvest because the summer of 2008 was drier than any other year. One young farmer had produced only around forty bales and decided to stop farming. (This is an extreme example, and perhaps he just did not have enough experience to deal with unforeseeable circumstances, or perhaps, he had another plan for his life in mind.) Therefore, dry summers are a serious problem for farmers.

Another farmers' concern, though less important, is rainfall and/or snowfall in the wintertime. It had rained more frequently than before in the wintertime, and it had snowed more irregularly. It tended to snow much at a time, yet, it soon melted, and the ground was bare for a longer period. More rain and less ground snow cover indicate the same farmers' concern – damage to the soil of fields. Ground snow cover provides much needed insulation for grasses, and without it, the root systems of grasses are not protected from the cold. Moreover, where standing water froze to form ice layers, the normal exchange of gases is prevented, causing an increase of carbon dioxide

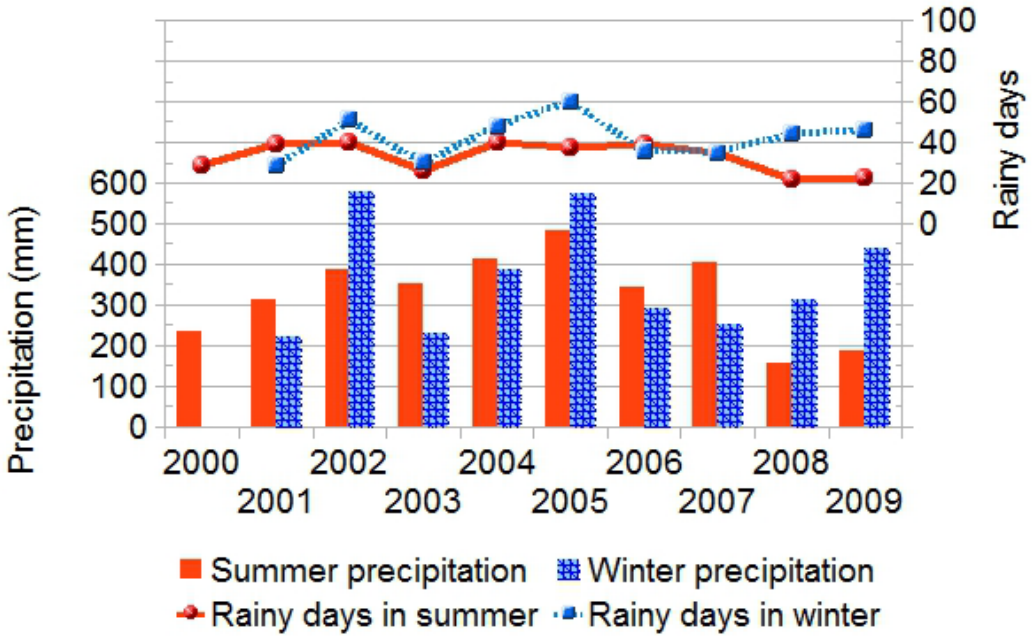

Figure 10-1. Precipitation and rainy days in Qaqortoq between 2000 and 2009

Rainy days in the summer means a summation of precipitation from May to October while that in the wintertime covers precipitations in November and December of the previous year and precipitations from January to April in the corresponding year.
Source: DMI (n.d.)

and lack of oxygen, leading to tissue damage and the death of grasses. One sheep farmer from the Qassiarsuk area told me that the winter was getting cooler although the monthly average temperatures have risen as shown in Figure 8-2. I speculate that this is because having less snowfall made him feel cooler than it was, or that by looking at the grasses dying in the fields, he noticed the changing climate conditions. To summarize farmers' vulnerability from the environmental side, temperature in the summer is the most decisive factor in deciding whether they can produce enough bales to feed their animals during the winter. This is a very critical matter practically and economically.

Let's move on to social actions to reduce vulnerability and enhance the adaptive capacity of sheep farmers at all levels (Table 10-1). First, Greenland government and associated institutions such as the Upernaviarsuk Research Station and the Agricultural Advisory Office have taken an important role to enhance the national-level adaptive capacity and to reduce sheep farmers' vulnerability when exposed to environmental stresses. Sheep farming was introduced by the Danish initiatives. In Chapter 6, I regarded this endeavour as the creation of a tradition to pursue a better way of life and future possibilities. The Upernaviarsuk Research Station has been promoting sheep farming and working on capacity-building of sheep farmers. The affiliated sheep farming school is set up to foster sheep farmers. Greenland's government has also taken a crucial role in providing financial support to reduce costs incurred by tillage, the building of housings and sheep sheds, and the purchase of heavy equipment. The government subsidises and loans to farmers with favourable terms.

Table 10-1 Local- and Regional- scale actions in Sheep farming

	Local	National	International
Environmental stress	- Climatic change impacting hay production - less rainfall - irregularity of weather conditions	- Climate change	- Global climatic change
Social stress			- Global economy (European) impacting prices of fodder and fertilizers
Sensitivity & exposure to stresses	- Ecosystem management (e.g., the prevention of overgrazing) - Inter-generational transmission of **local knowledge** concerning climate and the environment - Maintaining sheep farmers associations to collectively address issues farmers face.	- Government's Regulations and subsidies to build **sheep sheds** (in order to cope with severe winters) - Gov't's subsidies to the purchase of **heavy equipment**, to the establishment of **hydro electric generator**, and to **the making of fields**	- Financial and material support from Denmark
Adaptive capacity	- Making a decision to extend fields and to select grasses - Diversification of business (- Growing commercial vegetable [potato, etc.]) (- Embarking tourism)	- Building farmers' capacity through Agri. Res. Station, such as advisory services, introduction of new grass species, experiments of sheep breeding - Training professional sheep farmers at sheep farming school	- International co-operation concerning research, technology introduction, and experience exchange

Next, I move on to the sensitivity of sheep farming at the individual level (the "local" level in Table 10-1). Knowledge on past climatic and environmental changes and trends has been passed down

from previous generations, which serve farmers in creating the reference point for today's climate conditions. Forming a sheep farmers' association at each sheep farming area is also important in terms of providing a venue to discuss issues farmers face. These inform the locality's sensitivity to environmental stresses and help farmers gird up for their exposure to unusual and abrupt changes in the climatic and ecological system. Although stabling sheep in the wintertime was primarily to protect sheep from cold and starvation, it eventually served the prevention of overgrazing. (Since farmers let sheep graze outside during the winter in the past, overgrazing was a concern for many farmers.) This has made the local ecosystem less sensitive to harsh winters.

Third, local environmental knowledge and the availability of government subsidies inform their decision-making concerning the selection of coping options, such as the making of fields and the selection of grass species. Some farmers are embarking on agri-tourism, in which tourists can stay at a farm and enjoy farm life. The diversification of economic opportunities is important to supplement their income. These are regarded as local-level adaptive capacity.

Fourth, the intervention of government in enhancing farmers' adaptive capacity has both lowered and raised sensitivity of sheep farming to environmental stresses. In order to cope with severe winters, the government mandates farmers to stable their animals throughout the winter. Also, the pursuit of profitability has increased the scale of sheep farming. As a result, sheep farmers need to build sheep sheds, to establish or expand fenced-in fields for hay making during the summer, and to buy fertilizer, concentrates, and fodder from abroad through a trading broker established by a Greenlandic sheep farming expert. Truly, sheep farming has become robust; however, farmers have become dependent on government subsidies and

imported fodder and fertilizer. The building of sheep sheds, the making of fields, and the purchase of heavy equipment require government funding. Without financial support from government, it is not possible to set up even a hydro electric generator and a large sprinkler system. (Farmers began to consider building hydro electric generators to reduce the cost of living in isolated places. See Chapter 4.) Prices of imported items, such as concentrates and fertilizer, are subject to trends in the global economy, particularly economic trends in Europe. Abrupt increases in prices of imported items may cause farmers significant economic damage. Therefore, reducing natural vulnerability has eventually created social vulnerability to sheep farmers.

Vulnerability and adaptive capacity of hunters to multiple stressors

Since I already discussed this matter in Chapter 9, here I confine myself to explaining the main points illustrated in Table 10-2. The local manifestation of global climate change is obvious in northern Greenland. The monthly average temperature has risen by approximately 3° C, and this change has significant implications for the surroundings and consequently for living things on which hunters rely for their livelihood. The major changes in the physical environment are that the sea ice freezes later than before, and that it breaks up earlier than before. Consequently, the winter hunting period has been remarkably reduced by approximately three months, travel on ice has become less safe, and access to living resources has become difficult – all of which I have written about in the previous chapter. In effect, many articles describe the impact of climate change on hunting and the associated activities in this vein (Krupnik and Jolly 2002; Nuttall et al. 2005; Chapin et al. 2006; to name just a few).

Table 10-2 Local- and Regional- scale actions in hunting and fishing

	Local	National	International
Environmental stress	- Late freeze-up & early thaw - Animals' migration patterns changed - Pollution (Radioactive contamination)	- Climate change	- Pollution (contaminants, i.e., heavy metals & organochlorine)
Social stress	- Shorter winter hunting period - Danger in travel on ice - Difficult access to living resources - Depopulation of small settlements	- Greenlandic government's nation-building movement - Introduction of quota system by Government - Government settlement policy	- Animal rights campaigns in Europe - International animal conservation research initiatives
Sensitivity & exposure to stresses	- Locally-established rules	- National tannery buying seal skin (virtually a bailout operation for hunters) - Fishery rules through local fishers and hunters' associations	- Government's decision to leave EU
Adaptive capacity	- Flexibility (psychological & physical)		- Inuit Circumpolar Council (ICC)

Since a passage of this kind underlined above is just a cliché and does not convey what is actually happening in Greenland, I would like to propose to restate it as follows: the period when hunters can hunt 'on ice' has been reduced, travelling routes have been altered to avoid risks, and the timing of access to living resources has been shifted. This is because hunters can still hunt sea mammals by boat even though the sea was open in early winter and late winter, provided that

ice floes do not crush their boats; hunters can still travel to their hunting grounds through terrestrial routes if fast ice along the shorelines was unreliable; and this is because hunters can still have access to living resources by switching target animals if certain kinds of animals were difficult to approach during a certain time period. In other words, it is not likely that hunters in northern Greenland cannot hunt anything in the face of climate change. Based on psychological and physical flexibility and environmental knowledge earned through years of hunting experience, hunters have a wide variety of clues that are needed to cope with these changes. (That said, I do not mean to dismiss the hardship inflicted on hunters by changes in the climatic and ecological system. It would be a serious problem if there were a sharp decline in the seal catch because sea ice was too unstable to set nets under the ice.)

More serious and frustrating than climatic stressors are government regulations and policy that continuously fall on the shoulders of local hunters. For example, it is true that hunters in Avanersuaq do not hunt walrus in the wintertime because sea ice is less reliable than it was; however, this is not the decisive factor in their stopping hunting walruses in the winter. Since the hunting quota is set for one walrus per hunter (as of 2011), one trip in the spring is enough to exhaust the quota. Accordingly, it is better to sail once in spring than to take the risk of hunting on precarious ice in the winter. If they were allowed to hunt as many walruses as they wanted, then unstable sea ice may become a cause of a significant decline in walrus catch. Yet, it is the quota system that has caused a decline in their walrus catch, not unstable sea ice. The same logic is applied to seal hunting. The nationally owned tannery (Great Greenland in Qaqortoq) was closed for almost two months in spring 2009 because it could not clear its inventory reportedly due to anti-seal hunting

campaigns in Europe. This meant that hunters could not sell sealskins for that period. Therefore, it is government administrative restrictions that reduced the level of the seal catch, not simply unpredictable climate conditions. (As for pollution and animal rights campaigns in Europe put in Table 10-2, I will discuss them in the following sections on larger forces that hinder hunters' coping responses.)

All players' narratives going beyond climate change

At the initial stages of my fieldwork in southern Greenland, I confined my attention to understanding the impacts of climate change on sheep farmers' livelihood. Although fishing and hunting are central to the economies of more households than sheep farmers, I regarded that research on climate impacts on fishing and hunting to be of secondary interest, and as something that could add comparative depth to my material on sheep farming. Gradually, I realized that a simple comparison in the climatic and environmental impact between farmers and fishers/hunters would not make any sense. Here, I raise narratives of government, fishers/hunters, and sheep farmers on climate change, and examine what there is behind their narratives.

Government's narratives on climate change

Greenland government is not always negative about climate change. According to KNR, Greenland government expressed its view that Greenland may welcome and should benefit from ongoing global warming for its business, such as sheep farming, although it admits that a warming climate trend is detrimental to some livelihoods such as hunting (Kleemann 2010).

Tourism is another important industry in Greenland. During the summer of 2008, the number of cruise ships that called at Qaqortoq doubled compared to the previous year. It is beyond the scope of this chapter to evaluate the reasons for this, and it suffices to say because Greenland has emerged as a new destination for foreign cruise lines, searching for politically-safe, topical places around the world, according to the staff members of the tourist office. Global warming might have positive effects on the rise of the tourism industry because the media reports on climate change served to draw much attention to cruising companies.

The most important industry, in terms of the amount of profitability, is natural resource development. It is said that the Arctic contains approximately 13 percent of the worlds' unproven oil and approximately 30 percent of the world's undiscovered natural gas (Borgerson 2009). Melting sea ice has made it easier to tap its ample resources. Chances are good that Greenland may become prosperous from oil and gas exploitation off the west coast of Greenland.

Due to the government making positive statements about climate change, sentiments of nation-building and independence are growing.[89] As stated in Chapter 4, Greenland assumed self-determination, that is, a higher level of autonomy than under the previous Home Rule regime, under a Self-Rule Act on June 21, 2009, Greenland's National Day. Self-determination does not mean independence from Denmark, as is realized within the Danish constitution. In future, political independence will be granted to Greenland, provided that Greenland

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[89] This makes a stark contrast with the fact that the Inuit Circumpolar Council (ICC) of Greenland insists that global warming caused by developed nations' CO_2 emission infringes Inuit human rights, representing Arctic peoples as victims of modernization, globalization, and colonialism (cf., Nuttall 2009). This is a clear ideological clash between a view of Greenland's government that wants to gather momentum for nation-building and that of the ICC trying to champion an indigenous ethnic identity.

itself can financially manage the domains assigned to Greenland, such as policing and the courts; however, this is not the case at present as approximately 57 percent of Greenland's budget and about 30 percent of Greenland's gross domestic product (GDP) is transferred by a block grant from Denmark. Yet, the 2009 Act includes a section saying that Greenland acquires authority over its minerals, oil and gas resources.

If natural resource-based industry became commercially viable and Greenland received income derived from royalties and taxation from resource exploitation, the first 75 million DKK would go to Greenland, with further revenues splitting between Greenland and Denmark, where Denmark's share would be subtracted from the annual block grant. When the annual block grant from Denmark has been eliminated, any additional income will be subject to renegotiation between Greenland and Denmark (Nuttall 2008a, b; Worm 2011). Because of this, Greenlanders, particularly ambitious Greenlandic politicians, are excited about the shrinking sea ice, which makes it easier to tap petroleum reserves that previously defied developers. Although licensed Scottish petroleum company Cairn Energy PLC discovered a sign of petroleum reservoirs, it announced that a series of its exploration operations in 2011 ended in failure (Kumar 2011). In a similar vein, a plan to build an aluminium smelter in Maniitsoq is attracting considerable attention – the project is expected to exhilarate Greenland's economy since this project is estimated to require some 3,300 workers during the construction period and approximately 600 employees for operation (Hansen 2011).

Therefore, we need to consider the attitude of Greenland's government from the nation-building movement.

It was when I was interviewing a local hunter in Qaanaaq that I felt that a broader viewpoint was needed in climate change research. While we were talking about climate change impacts on hunting and the environment in which hunting took place, he began to comment on concerns over the exposure to radioactive contamination and the bio-accumulation of persistent organic pollutants (POPs) in wildlife. It seemed to me that his changing subject matter was all of sudden. While I was interviewing, I thought the hunter misunderstood my questions or was sidetracking me. I even thought I spoke Greenlandic incorrectly. Yet, looking at Table 10-2, we can now see that he was telling me his concerns over the future of hunting in a broader political and social context.

As for radioactive contamination and marine pollution, it may be needed to explain why these matters have been looming concerns in the area. In January 1968, a United States Air Force B52 bomber carrying four nuclear weapons crashed on the sea ice on Bylot Sound, about 12 km off the Thule Air Base. As a result, part of the plutonium was dispersed over a few square kilometres of the sea ice. After that, an extensive clean-up campaign was carried out by the U.S. and Denmark, and the remains of the wreck and a large amount of contaminated ice were shipped to the U.S. while plutonium remained in the seabed after the ice melted. I once heard that a local hunter who participated in the rescue operation was diagnosed with leukaemia a dozen years later, which was suspected to have something to do with the 1968 Thule Air Base B-52 crash. As early as in the mid-1970s, concern arose about high levels of human intake of contaminants in Greenland (Johansen et al. 2000), and it was in the late 1980s that international co-operation was initiated to monitor the

environment as well as peoples in the Circumpolar North (Arctic Monitoring Assessment Programme, AMAP, 1998). Since then, a rich body of research has reported that contaminants emitted from far away countries travel through air and water and concentrate in bodies of sea mammals, such as seals and polar bears particularly, which occupy higher trophic positions of the marine food web. It is reported that in Greenland, where traditional food is highly valued, local inhabitants are liable to take in higher rates of contaminants, including metals such as mercury and cadmium and organochlorines such as PCBs (Johansen et al. 2004).

Therefore, we can see hunters view climate change in relation to larger environmental, political, and social context.

Narratives of hunters and fishers in Qaqortoq

The above-mentioned way of talking about climate change is not only peculiar to the hunter in Qaanaaq, but also to other hunters in Qaanaaq and Siorapaluk. Likewise, hunters and fishers in Qaqortoq often addressed their concerns in a similar manner. When I was asking about climate change impacts to a hunter in Qaqortoq, he started to say that it did not make sense at all to him that the government limited hunters to 30 *appa* per day. He continued that because a hunter did not hunt 30 *appa* every day, hunting would not possibly contribute to a decline in the bird population.

The same tendency was also found in fishers in Qaqortoq. Having commented on climate change, they often ended up saying they had trouble with large-scale trawlers which caught a large amount of fish offshore. Small-scale fishers set fishing nets called *bundgarnit* (Dan. *bundgarn*) in shallow waters along the shorelines. They make a living by selling their catch mainly to the only fish processing factory

in Qaqortoq (Greenland Arctic Prime), and the rest of their catch are sold at the *kalaalimineerniarfik* (the local food market) by the wharf. Unlike large-scale fisheries, local, small-scale fishing is not restricted by the quota system, since the amount of small-scale fishers' catches is incomparably smaller than that of the factory's long-liners. When asked, local fishers were able to enumerate the changes they had noticed in their environment, such as change in the flow of the current, in the wind direction and intensity, and in the way a storm occurs. Not many fishers enthusiastically talked about a warming trend. On the contrary, officers at the fish processing factory confidently spoke that they would likely benefit from global warming although the level of cod hauling had not lived up to their expectation. Of course, the Greenland Fishers' and Hunters' Association (Kalaallit Nunaanni Aalisartut Piniartullu Kattuffiat, KNAPK) was working on negotiations with government and large-scale fishing companies to defend small scale fishers' and hunters' interests, it would take time to reach an agreement among the interest groups.

As seen from the above, hunters and fishers in Qaqortoq also associated climate change with social and political issues they had.

Narratives of sheep farmers

While fishers and hunters mentioned a lot about changes in their environment when asked about climate change, sheep farmers tended to question a warming trend that was generally reported in the media. There were some who said it was good for sheep because bushes grew well, but many answered that warming and cooling periods alternated and that was nothing new to them. Some who knew and heard about the warming period in the 1940s replied to me that it was not warmer now than it had been in those days. I hardly met hunters and fishers

who put emphasis on the alternation or the repetition of climate trends.

Why were they so different in the way they narrate climate change? That discussion will be further developed in the following sections.

Greenlandic perceptions of the surroundings

Early on in my fieldwork in Greenland, I was often stressed out by the precarious local weather as well as the reaction of Greenlanders to it. When I asked if we would be able to sail the following day, two days later, or a week after, their answers would be always "*Naluara* (I don't know.)," "*Immaqa...* (Maybe...)," or "*Asikiaq* (I have no idea)!" Then, they would continue, "Sila naalagaagami [Because the weather is the boss.]."

Treacherous weather that defies prediction

The vicissitude of the Arctic environment is complex and its landscape never stops transforming, just like the water of the flowing river never stays the same. An inlet of the glaciated fjord can become filled with ice floes just in one night and then the ice disappears in the next couple of days, drifting in and out from the outer sea. Wind direction and its intensity and temperature; the timing of *nigeq* (foehn wind), *avanna* (the north wind) and other types of high winds; and waves and the swell of the sea – everything that relates to the weather conditions – fluctuates in a way that often defies prediction. From my experience of living there, the variability of the weather is such that no one can predict whether one will be able to travel on a given day until that day arrives.

Boats are the only practical means of transportation available for local people. If the wind picked up on the planned day, a whipped-up sea would prevent sailing. Air transportation between towns is no exception, either. This is not limited to my own experience but is also found in other authors' writings (e.g., Bates 2007; Briggs 1991).

In such a transient environment, it is absurd and unrealistic to predict what will happen in the future. For example, Bates (2007:93) states that eastern Copper Inuit in Cambridge Bay, Canada, were embarrassed when asked to predict a future trend in the local caribou herd and animal propensities. According to him, Inuit may even think of claiming knowledge about the future as human's arrogance and that the act of trying to know about the future state of animals is the same as disrespect for animals. From a Canadian Inuit point of view, it is regarded as "childish" to make a sweeping generalization (cf. Briggs 1968:40). This is because there are many cases in natural settings to which general laws cannot be applied. Placing oneself in a fluid environment, one should allow a contingency situation and an unexpected accident.

The dangerous environment that requires being alert

Moreover, danger lurks everywhere in the surroundings, which imprints on local inhabitants' minds an idea that the world is full of uncertainty and that they should be cautious and sensitive to subtle movements of their surroundings (Briggs 1991). Death of someone close to them may suddenly take place. For example, during my stay in Greenland, I sometimes heard about local people who were killed in boat accidents, where their boats struck a rock and capsized. Similar stories were told in which hunters in northern Greenland were attacked and killed by walruses, while they were travelling by kayak.

Accordingly, the art of surviving in this kind of unstable, fluid, and dangerous environment requires a high sensitivity to quickly size up situations, the perseverance to wait for a danger to pass by, and the bold agility to act when opportunity arises. For example, I heard from a hunter in northern Greenland that he bivouacked for several days on the ice sheet, shielding himself using the sled and a tarp, when he was caught by a snow storm on his way home. He sensed that it was too risky to continue sledging at that time and decided to wait for the high wind to weaken. In this kind of circumstance, it would be reckless to act based on groundless predictions and forecasts. Instead, one needs to wait patiently until an opportunity arises, and when it arrives, he or she needs to take action without hesitation, so as to come through the danger or to solve the problem that he or she faces.

Leaving possibilities open in the future

From an Inuit point of view, the future cannot be scheduled; it is kept open for the possibilities (Bates 2007:90). An important thing is to respond effectively to the current situation as it transits from moment to moment. Of course, they anticipate what is likely to happen in the immediate future and make a projection, based on past experience and knowledge (Nuttall 2010); however, it is necessary to be flexible psychologically and physically, so that the judgement and course of action that they had in mind at the previous stage can be modified, adjusted, and renewed according to opportunities and obstacles that arise at the next stage. Effectively responding to the current situation will lead to possibilities opening up in the future. In order to do so, one needs to begin with grasping the current situation precisely, not to begin with predicting the future. By so doing, he or she can come through difficulties or grasp an opportunity.

Accordingly, it is important to accumulate experience and knowledge in their working landscape, land and sea, which inform their frame of reference when exploring several possibilities for the future.

Sheep farmers' perceptions of change

The above-mentioned perception of the environment and the future is evident in hunters. It seems to me that, in addition to this perception, sheep farmers have the recognition of the cyclic nature of their environment.

The history of the development of sheep farming in south Greenland, as we have already seen, is the history of coping with climatic fluctuations. Consequently, from their experience and trans-generational memory, they knew severe winters occur cyclically with milder winters in between. Harsh winters, particularly the one in 1967-68, were so memorable and widely known among sheep farmers that many sheep farmers whom I talked to told me about these winters, even though none of these middle-aged farmers actually experienced them.

Moreover, Norse ruins are scattered around today's sheep farms. As I mentioned in Chapter 5, all the current sheep farms have been established in a manner that simply replaced old Norse ruins. Accordingly, farmers could discover that ruins convey visible and tangible images of the human habitation during the past warm period. This local memory from several hundred years ago may inform farmers that the climate of their environment fluctuates in a longer time span. In other words, ruins help connect the past and the present in their everyday life, possibly providing a frame of reference for the future.

I have heard there were two types of characters among Greenlanders: the hunter's mindset and the farmer's mindset. The

hunter-type person has a disposition to do nothing special in ordinary times but is alert for opportunities. As soon as an opportunity arises, he or she never hesitates to grasp it and take action swiftly. Then, once it is done, the hunter type rolls back and waits for the next. In contrast, people with the farmer's mindset have an inclination to work a step-by-step process scrupulously presuming they will have the cyclical nature of almanac events – lambing in May, tilling in June, round-ups in September, tupping in December. This typology is not only confined to Greenlanders but is a noteworthy viewpoint since few research studies have been done on farmer Inuit as opposed to hunter Inuit.

What is "change" for local people and what is "the same" for them?

According to this perspective on the environment (surroundings) and the future, what we think of as change may not be the change for Inuit because the world for them is always unstable, fluid, and transient. This is evident in a remark of an Inuit elder from Kugaaruk (Pelly Bay), when asked for a comment on year-to-year change in his surroundings,

> "Everything is the same every year because everything changes every year," (Omura 2005:79).

The elderly hunter I introduced at the beginning of this chapter was brought up in a hunting family. His father always took him hunting when he was a child, and he naturally became a hunter. Some fifty years ago, starting in May, his family used to go on a hunting trip out on an island near the outer sea and would spend three months hunting for seals.

In the springtime, seals are migrating from the south along the southwestern coastlines, following drift ice from the east coast of Greenland. In those days, hunters used kayaks, not outboard motor boats, which now make it possible for hunters to shuttle between the town and the outer sea within a few hours.

During my interview, from my ignorance, I asked him if there were occasions on which hunters used *qamutaasat* (a white screen for hunting seals basking in the sun on the ice, which can be used only when the user is on the ice; see Chapter 9) in those days. Responding to my question, he said that there could have been such occasions in those days, but that this is not the case for today because the fjords do not freeze any more. He also mentioned that the difference in sea level between low and high tide has been increasing. In other words, he was able to bring forward some examples of recent changes in the climate and the environment he had sensed from his hunting activities.

Nevertheless, he insisted that the climate was not changing because he was always able to kill as many animals as he had been. That is, he was sensing signs of some changing climate conditions, but he thought these were within the natural climatic variations and within the scope of his ability to cope. Consequently, he does not "'believe in'" the climate change that is reported in the media. Incidentally, he did not seem to be involved in any political or ideological activities.

Why do people say what they say?

As discussed above, what we think of as change may not be change from a Greenlandic standard. Nevertheless, there are people who want to attest that the climate is changing and this is impacting their

lives. How can we interpret narratives of hunters that testify climate change is real? I bring forward what is not itemized in Table 10-2.

Oppression and risk perception

As I have pointed out above, hunters and fishers tended to talk about problems and difficulties derived from stressors other than climate change when asked about climate change impacts on their livelihoods. I speculate that hunters' and fishers' feelings about their livelihoods and themselves are complex. Here I analyze this matter from their subjective point of view.

It is reported that the subjective experience of social vulnerability and sociopolitical underpinnings can significantly inform one's perception of risk (Satterfield et al. 2004). According to Satterfield and her colleagues' (2004) analysis of telephone interviews, which targeted the U.S. residents including Caucasians, Hispanics, African-Americans, Asians, and American-Indians and persons with multiple cultural heritages; those who think they themselves are discriminated against tend to express more concerns about environmental risks than those who do not. Moreover, they reveal that non-white persons have higher awareness of environmental risks than Caucasians, and that females are more sensitive than males to environmental risks. In other words, people who evaluate themselves as being treated unfavourably or feel that they do not benefit from economic opportunities have a tendency to rank risks as higher than those who do not.

Hunters have many concerns other than climate change, and for them climate change is just another entry on the list of their concerns. In the first place, hunting is not a profitable occupation, but rather it is a matter of choice for a way of life. As I stated in Chapter 4, hunting

provides Greenlandic traditional and spiritual values. It seems to me that those who want to pursue a spirit of independence, self-reliance, and competency on land and at sea become hunters. However, it is a fact that hunters are in effect in difficult circumstances.

To take life in a settlement where many hunters live as an example, settlements do not enjoy sufficient government support. Public transportation services are inconvenient, public services are poor, and living costs are higher compared to towns. Moreover, disturbing political moves have been going on.

Small settlements with fewer than 100 residents may be closed down for economic reasons. In the past, hunters were deprived of the mobility that is necessary for hunting under the name of centralization and urbanization. They may end up losing their strongholds this time. Furthermore, as sentiments towards political and economic independence is gathering momentum, a nationwide inclination is to value lucrative jobs and industries, such as mining, oil and gas development, tourism, and other forms of businesses. A general view for hunters is that they could not benefit from a warming climate as other industries including sheep farmers could. Consequently, hunting is a declining occupation, although I do not think hunting will be vanishing any time soon. These facts significantly bear on hunters' self-images and general images on themselves, including their social status.

There are more to hunters than these. In addition to these difficult circumstances surrounding a hunting way of life (Dahl 2000), there are much larger forces than they can manage. Campaigns against seal hunting and animal furs have been carried out in Europe for years. A polar bear has become an icon as the victim of climate change, creating a momentum for more conservation awareness (Freeman and Foote 2009). Environmental activists travel around the

world to oppose whale hunting. Then, these efforts unfairly and unjustifiably intrude into hunters' economic lives such as in the form of the quota systems. In a similar fashion, what loomed larger than climate change for fishers were political and economic troubles that developed upon their shoulders such as large-scale trawlers operating offshore to reduce their catches and a considerable decline in cod prices due to, for example, the global economic crisis represented by the financial collapse of Icelandic banks in 2008. These political, economic, and administrative affairs are out of the control of hunters and fishers and these are much more influential to their lives. Therefore, all these looming concerns are enough to create a feeling of oppression to hunters and fishers.

If Satterfield and her colleagues' (2004) theory is the case in Greenlandic hunters and fishers, it leads that they saw themselves as having trouble envisioning future prospects in the face of political, economic, and social perturbations. For this reason, hunters and fishers had an inclination to talk about problems and difficulties that they are facing in relation to climate change. It seems that behind this inclination, they may have wanted to channel their sentiments, frustrations, and a plea to the outside world. This inclination was more noticeable among hunters and fishers with political or ideological awareness. Therefore, climate change research requires not only a broader perspective towards the political, economic, and social context, but also a perspective towards the sociopolitical situation and subjectivity of the narrator.

What people say, what they really know, and what they hope for in climate change

It must be remembered that interviewing local people about climate

change requires caution to determine whether what interviewees are talking about is what they really mean and whether they are just repeating what is generally told about climate change.

When local people in southern Greenland spoke positively of climate change when asked for their comments on it, I could not help suspecting that they were just reiterating a general image of climate change impacts on southern Greenland.

Looking from a neutral point of view, it is obvious that the current situation under a changing climate in southern Greenland is not totally favourable for all players and that it is still an open question. For example, even though it has been said that a rise in sea temperature would pull the cod back to the Greenlandic coast, for those fishers who experienced bountiful catches of cod before 1970, there are not yet as many cod as expected. In addition, the fish currently caught are still smaller than those previously fished. Although it has been said that an extended growing period by two weeks due to a warming trend in climate would make it easier to grow vegetables, farmers knew that a shortage of rain reduced hay production instead.

I always kept in mind that Greenlanders knew very well how people from the rest of the world had described their land under climate change and what outsiders wanted to write about. Since there was a growing interest in Greenland in relation to climate change, many foreign researchers and journalists had already rushed to Greenland to carry out research and obtain good news-making stories. In a sense, Greenlanders became accustomed to having climate change interviews carried out by foreigners.

Another thing I was always cautious about is that the locals sometimes put their hope in their remarks. A narrative of a warming trend possibly bringing prosperity to southern Greenland is sometimes

used in the context of nation-building, in which industries benefiting from global warming will contribute to the enhancement of the general economic level of Greenland – and ultimately to the independence of Greenland. They wisely knew that it would not happen in a short time. Rather, it sounded to me that a sentiment like this was the language of picking themselves up.

One example for this is that cattle raising was narrated in this vein. Among sheep farmers I talked to during the years 2008-09, there was a farmer who had approximately 30 cattle in addition to some five hundred sheep and a dozen horses. According to him, the number of bales he produced in 2008 was reduced by half, compared to the previous year, owing to the dry summer of that year; nonetheless, he commented that he found the warming climate most welcoming for cattle-raising. During that same period of time, the Upernaviarsuk Research Station was keeping cattle to see if cattle-raising was feasible in Greenland's situation, with the ultimate purpose being the diversification of farming options in the future. Cattle on the green pasture in the fjord landscape of Greenland with icebergs forming a backdrop appealed well to outsiders and this often became one of the news hooks in media reports.

However, farmers know cattle feed more than sheep do. It is quite obvious that cattle-raising requires more bails to be produced and more concentrates to be imported. Under the current climate conditions, drier summers and less snowfall in the winters, cattle raising might possibly become a burden to farmers. This is why many sheep farmers had qualms about having cattle. In effect, there was a trial of keeping Tibetan yak in Tasiusaq in 1962, but ten years later it ended because it turned out that it was not worth continuing in an economic sense (c.f., Bak 1981:96). The above-mentioned cattle owner is related to the farmer in Tasiusaq who tried yak herding, and he

must have been well aware of the shortcomings of cattle-raising. In addition, as we have seen in the history chapter, farmers in Igaliku stopped cattle-raising for some reasons before and after the turn of the 20th century. (I hasten to add that I do not intend to dismiss this cattle owner's entrepreneurship. It is quite ambitious that he decided to test cattle raising to take advantage of warming.)

As seen from another trial of cattle raising in Timerliit in Chapter 5, cattle raising is something like what a farmer with extra time and money carries out on an experimental basis. In fact, I had an impression that this cattle owner was rather on the prosperous side, hiring a couple of helpers from town and running side businesses during the farming off-season. It would be appropriate to think that his comment was made not from a local farmer's perspective, but from the wider political, economic perspective with his hope placed in climate change.

Therefore, it is very important for researchers to try to understand why interviewees say what they say and why they think the way they think when interviewing them about climate change.

Why they say what they say

Upon interviewing, one needs to consider carefully whether or not interviewees are reiterating a general view of climate change on the side of the wider context, and whether or not they literally say what they want to mean. Some wish to channel into the outside world their sentiments, frustrations, or a plea, in a wider context of climate change, by narrating their stories of livelihoods which are impacted by unreasonable and unjustifiable pressures for them. Some may want to emphasize the good side of climate change, trying to inspire themselves, by fitting their stories to outsiders' positive evaluation.

In other words, there is a time when an interviewer cannot accept interviewees' narratives at face value.

I am afraid that climate change researchers tend to focus on only matters of climate so that they take everything said without doubting it. Perhaps, journalists are more likely to do so. Due to time constraints, they may write stories that they had in their minds beforehand, not carrying out further research on the political and social context in which interviewees are situated. There are just as many narratives for climate change as there are narrators. In order to understand a wide variety of narratives of climate change, we need to scrutinize what made them say what they say, by taking a close look at the social, political, and economic situation of the narrators, which underlies their remarks and actions.

Concluding remarks: narratives adumbrating what they mean but still elusive

If there had not been information from the outside world (i.e., media coverage), locals (hunters, fishers, and farmers) might have told me about climate change differently. The Arctic environment is ever shifting, and everything, both animate and inanimate, never stops transforming. Of course, this is the case for anywhere on the globe, but the extent is prominent in the Arctic. The world is always in motion and is full of uncertainty, so that it defies a sweeping generalization of how things work. The art of surviving in such an environment is to size up the situation, being always on alert to any subtle indications coming up the surface of the world, which may elude unskilled individuals. From a Greenlandic point of view, where nothing ever stays the same, what we think of as change may not be change for them. In effect, even though the sea freezes up late and

the ice thaws earlier, hunters can still find a way out of their difficulties in the face of environmental alterations. Similarly, by paying attention to Norse ruins (see Chapter 5), sheep farmers can discover people's lives in the past. They can also learn from elderly farmers that there were bad times and good times during the adaptive process of sheep farming and that the temperature fluctuated up and down in the meantime.

Nevertheless, people do talk about change. They know how the rest of the world narrates climate change, Greenland, and Greenlanders. There are times when they narrate their stories in such a manner that fits them to outsiders' expectations, and there are times when they narrate their stories in a wider context beyond climate change hoping to channel their sentiments, frustrations, or a plea to the outside world. And, there are times when they literally say what they really mean in a delicate way. This is because climate change is not only a matter of climate but also a matter of all things relating to their lives.

As I stated in earlier chapters, self-reliant individuals can create a tradition so as to get rid of irrational burdens that are stumbling blocks in the effort to envision future possibilities. However, even these people's initiatives to implement a social transformation are perhaps frustrated by larger forces including the quota system, world economy, and international environmental movement. Therefore, in order to better understand their narratives on climate change, it is necessary to scrutinize larger forces that bear on the narrators' political, economic, and social situations, as well as the narrators' subjectivity that informs the way they envision future prospects.

I have also cautioned that researchers scrutinize why they say what they say, what made them say what they say, and why they think the way they do. I do not intend to disregard the fact that local

inhabitants are facing difficulties caused by climate change. Rather, my point is to put emphasis on the holistic understanding of the intertwined nature of climate change.

In terms of the way people narrate climate change, I have an image in my mind, in which a statue named climate change is placed in the centre with various players surrounding it. The players describe in turn how the object looks from their points of view. Even though they describe the statue as they see it, their narratives are slightly different from each other. A researcher is blinded by a mask and just listening to them. It may not be possible to grasp the complete image of the object but I believe that we can achieve a better understanding of the narrators' situations that inform their remarks, ways of thinking, and actions.

11. Conclusion: Allowing Possibilities to Open Up in the Future Through the Creative Lives of Individuals

This dissertation has investigated how Greenlanders sense, interpret, react to, and narrate environmental change caused by a changing climate. In order to do so, it is necessary to understand their human-environment relationships from the past and to the present, their perspectives of their landscapes, and values by which they live on the land. A historical approach to this research question led me to deal with Norse and Danish human affairs in the periods of natural climate cycles and today's Greenlanders' circumstances under allegedly human-caused global climate change. This ethnographic research, at the same time, required me to investigate why they say what they say, why they behave the way they do, and why they think the way they do, since the nature of this research project is not the problem-solving type but rather aims to understand their social/cultural orientation towards the transforming environment.

While investigating, it became clear that the way of cultivating the future is varied among sheep farmers in the south of the country, fishers/hunters both in the south and the north, Danes initiating and promoting sheep farming and tree-planting, and other foreigners migrating into the country in the past. This is because my research question is not only a matter of climate but relates to a wider environmental, political, social, and economic perspective. During my research, I have sought after how Greenlanders use their knowledge and skills, exercise ingenuity, attend to those clues which may give them prospects, and how they develop ambitions for the future in order

to make their lives and livelihoods viable in the course of environmental, political, and social transformation. Paradoxical as it may sound, as I proceeded, the direction of my research, which was designed to focus on climate change at the early stage, gradually began to drift away from climate change as such. Why it did so will be clear below.

Sheep farming is a challenging occupation, requiring farmers to be industrious, hard-working, independent, psychologically tough, and creative. Through the historical process of the government development of sheep farming, the scale of sheep farming was elevated, through the organizational efforts to modernize it. Those who wish to keep sheep are required to build sheds and to secure winter fodder. In order to earn back the cost of their investments and to make their businesses viable, sheep farmers are required to keep large flocks of sheep. This necessitates that farmers live at a place faraway from town. Accordingly, to become a sheep farmer means to become a pioneer or a settler in an isolated, wild place. Yet, a place to settle is neither totally foreign to them nor a romanticized place in the sense of the North American "wilderness" image (Cronon 1995). These places are not imaginary empty spaces, but part of the sphere of their activities, the sphere they can hold a sense of place, and the sphere of their belonging. However, they need to carve their own paths in isolated places from scratch, building the houses and sheep sheds, repairing farming facilities, fencing up, taking care of the animals, tilling, harvesting, and rounding-up. They settle in places that may offer prospects for the future, envisioning a better way of life, carrying opportunities forward to the future, and exploring possibilities. Some farmers fail and others succeed in their projects.

Although sheep farming is an arduous livelihood, farmers try to be sheep farmers, aiming at self-realization on the fjord landscapes.

The values that a life of sheep farming gives them include hope for the future, responsibility for everything that relates to their lives, independency, competence on their landscape, and a care for nature. At the same time, their skills and inner strength are always tested. From a different point of view, it is only the individuals who are independent, responsible, self-sufficient, and able to maintain their ties to the landscape that can create and develop a tradition that will bring a sustainable life for the community.

In order to create a tradition – in this case, sheep farming – it is necessary to start with the existing tradition and to rebuild it with input from the external world in such a manner that fits the socio-economic needs of the community. As for the introduction of knowledge and technology, ironically Greenland had much stimuli, for it was under the Danish colonial rule. Taking advantage of the colonial rule, Greenland was able to network with other Nordic countries such as Iceland and Norway to absorb knowledge and technology and went so far as to bring in human resources necessary to promote the endeavour of the creation of tradition. The project of the creation of a tradition needs key persons who are determined to reduce problems inherent in the community (or derived from the political and social circumstances) and to implement what would otherwise not happen if someone did not venture to undertake it (Ichii 1982, cited by Tsurumi 1989).

For Tsurumi's (1989) Endogenous Development Theory, key persons are to appear from inside the community, but interestingly, in the case of Greenland, key persons appeared from the suzerain state. Danes experimentally introduced sheep into Greenland. Presumably, it happened independently of Greenlanders' requests, and Danes pictured a better way of life for Greenlanders based on their point of view.

In this respect, it can be said that Greenland is a country of experiment. As time went by, sheep farming gradually took hold in the sociocultural soil of Greenland and became a local tradition. This happened because key persons were gradually shifted from Danes to Greenlanders who appreciated the advantage of this tradition.

Here I use the concept of tradition in the sense of Tsurumi (1989, 1996), not that of Hobsbawm and Ranger (1992). While the latter rather place an emphasis on tradition as an end product of the formalization and ritualization processes of social practices, which have no room to adapt to unforeseen and unprecedented issues, the former see hope in the creation of tradition to get rid of a hindrance to locals' cultivating the future.

Another example of a created tradition is tree-planting projects that were also initiated by Danes, not on the request of locals. Although this has attracted much attention from the public only recently due to the warming climate, the impetus of the projects came from a foresighted foreign biologist's experiment from a hundred years ago. Then, tree-planting was later taken up again by the people and the practice has lasted for more than sixty years up to the present day. This proves that there were people outside Greenland who made efforts to cultivate a future for the island within a period of natural climate cycles, even though it was in an experimental manner. Whether this tradition takes root in Greenland depends on whether or not more key persons, who can creatively explore future possibilities with plantations, can possibly appear within the community. Again, what I mean by community is the larger area of southern Greenland not one specific settlement. Incidentally, I did not find any particular conflict concerning resource use among sheep farmers, fishers, hunters, and tree-planters.

One of the key themes of this volume is how people,

Greenlanders in this case, cultivate a future in a difficult situation. The Arctic communities give witness to "unprecedented" alterations in the climate system and the environment on which they live. Whether they will be able to overcome difficulties derived from the local manifestation of recent global climate change remains an open question. While no one can possibly predict the future, my point is that the fjord landscape can provide Greenlanders with clues that inform their frame of reference when they envision a better future in such an uncertain situation.

One that informs Greenlanders' frame of reference is the fluid, unstable, ever-shifting nature of the Arctic environment as such. The Arctic landscape never stays the same and dramatically transforms from one moment to the next. The environment of this kind defies a sweeping generalization and a rut when making a decision for a course of action (Bates 2007; cf., Omura2005). This requires the Arctic inhabitants to nurture an ability to be on alert for every subtle clue in order to size up a situation, the perseverance to wait for a danger to pass by, and the bold agility to act when an opportunity arises.

A trajectory from the present to the envisioned future can never be predictable since a situation will transform from moment to moment. No one can ever know what the situation will be in the future until he or she chooses to take a reasonable action at that time. For this reason, it is very important to be psychologically and practically flexible and to be competent in working on the landscape. The future is not scheduled, but it is important to proceed with one's project and endeavour by allowing possibilities to open up in the future. An attitude of exploring possibilities with psychological flexibility informs the ability of envisioning a future life.

Another clue for the frame of reference is constituents of the landscape, animate and inanimate, that give a perspective towards life

cycles from the past to the present and the future. As is often the case with the Nordic countries, in Greenland, land is sparsely populated and there is scarcely a building to block one's sight. The wide visibility brings a strong sensation of being situated in a particular space and a temporal perspective of contrasting the past and the present (Hastrup 2008). A case in point is the presence of Norse ruins around sheep farms along the shorelines of the fjords. Simply, today's Greenlandic sheep farms lie along the shorelines of the fjords in a manner that replaced the past Norse farms. Norse ruins that are seemingly just relics of the past actually give a clue to discovering life cycles of living things and inanimate objects in the past (Ingold 2000:189-208). When positioning rhythms of the life cycles of the past and the present landscape constituents, animate or inanimate and including the self on the same time-line, one can learn to discover the temporal continuity in the landscape from the past to the present and hopefully to the future. In a similar line, one may see the horizon of potentials to open up a better life in the landscape to which he or she has a strong belonging (Sejersen 2004).

It can be said that Greenlanders have plenty of clues to discover their spatial and temporal connection to the landscape. They learn to know the landscape is always shifting and transforming from past experiences of subsistence activities (e.g., Nuttall 2009). In effect, a history of the development of sheep farming is a history of responses to the historical fluctuation of climate. Accordingly, sheep farmers are aware that temperature has been fluctuating historically. Hardships, frustrations, ingenuity, fortitude, generosity, and many other things experienced in the course of the past sheep farming businesses are passed down from previous generations. In this respect, they are learning from the past how to see, think, and act. Also, from the direct or second-hand experience they know the fact that environment

change caused by the temperature fluctuations led to the boom and bust of Atlantic-cod and shrimp fishing, which triggered the dynamic demographic transition among seal hunters, fishers, and sheep farmers throughout south Greenland. Even so, this is the result of people's intentionally exploring future possibilities enabled by their competence on the land and sea, which is grounded in the fact that they always renewed and expanded their environmental knowledge and skills for living off the local resources.

Nevertheless, narratives on climate change vary among people. We have seen some narrate it positively and others negatively. The reason for this is because the way they envision future possibilities are different among them. Social positioning, status, subjective experience, and others all bear on the way of envisioning the future. Accordingly, we cannot properly understand climate change issues until we understand why they talk about climate change differently, what their narratives are implicating, how they feel about themselves and how others see them. In northern Greenland, for example, the sea freezes later and the sea ice thaws earlier than before. We understand that this change significantly affects their hunting activities, travel safety, and access to living resources, if only taking into consideration a matter of climate. Yet, for those who realized that the environment always transforms, it is still negotiable, and it is still possible to continue to engage in their livelihoods in the face of climatic and environmental stressors. Here, I hasten to add that I do not intend to underestimate the extent of the climate change impact from which they suffer. The problem is that forces other than the climate component, such as international affairs, national politics, and global economy, are looming larger in their minds. It seems to me that hunters are highly competent in the Arctic environment with a wide variety of coping options. In other words, they are capable of

reducing natural vulnerability on their own. However, the above-mentioned larger stressors more seriously crush their hope for the future and hamper and frustrate them from envisioning future prospects. Accordingly, just enumerating coping strategies with a model theory, taking notes straight from what interviewees said, and processing data on a statistical basis do not help understand climate change issues properly. Their frustrations are well reflected in their narratives on climate change. It is necessary to study how local people form their identities in relation to the environment, the historical processes, and the values they live by on their landscape.

In the adaptation processes of sheep farming, its intensification led by government caused farmers to be dependent on government support and subsidies. Without subsidies, it is almost impossible to build sheep shed and fences, to make and expand fields, and to purchase heavy equipment, fodder, and fertilizer. Dependency on imported items has made them subject to global economy. Even coping with fluctuating international market prices is difficult to get through without government support. That is, reducing natural vulnerability (harsh winters) has ended up with creating social vulnerability. Although these larger forces (fluctuations of prices of fodder and fertilizer) matter to sheep farmers, their narratives on climate change, more or less, go along with the historical frame of reference I have stated above. However, how larger forces support or frustrate in future sheep farmers' efforts to envision a better way of life is open to question.

In recent years, there has been a large upsurge of movement towards a higher level of independence in Greenland. As I noted in previous chapters, there are many different expectations revolving around a warming climate trend. Since full independence from Denmark cannot be achieved without a self-sustained economy, the

government has been eager to develop lucrative industry in the short term, such as the resource-extraction-based industries. In any case, it is necessary to create a situation, where people can freely make an effort to carve out their lives with hope. Then, it is important to nurture self-sufficient individuals who can envision a better way of life, explore future possibilities, and implement their endeavour to overcome problems inherent in the society. I believe that this will lay the groundwork for the continuance of localities, communities, and ultimately, the building of a sustainable nation.

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