Living with climate variation and change;
A comparative study of resilience embedded in the social organisation of reindeer pastoralism in Western Finnmark and Yamal Peninsula

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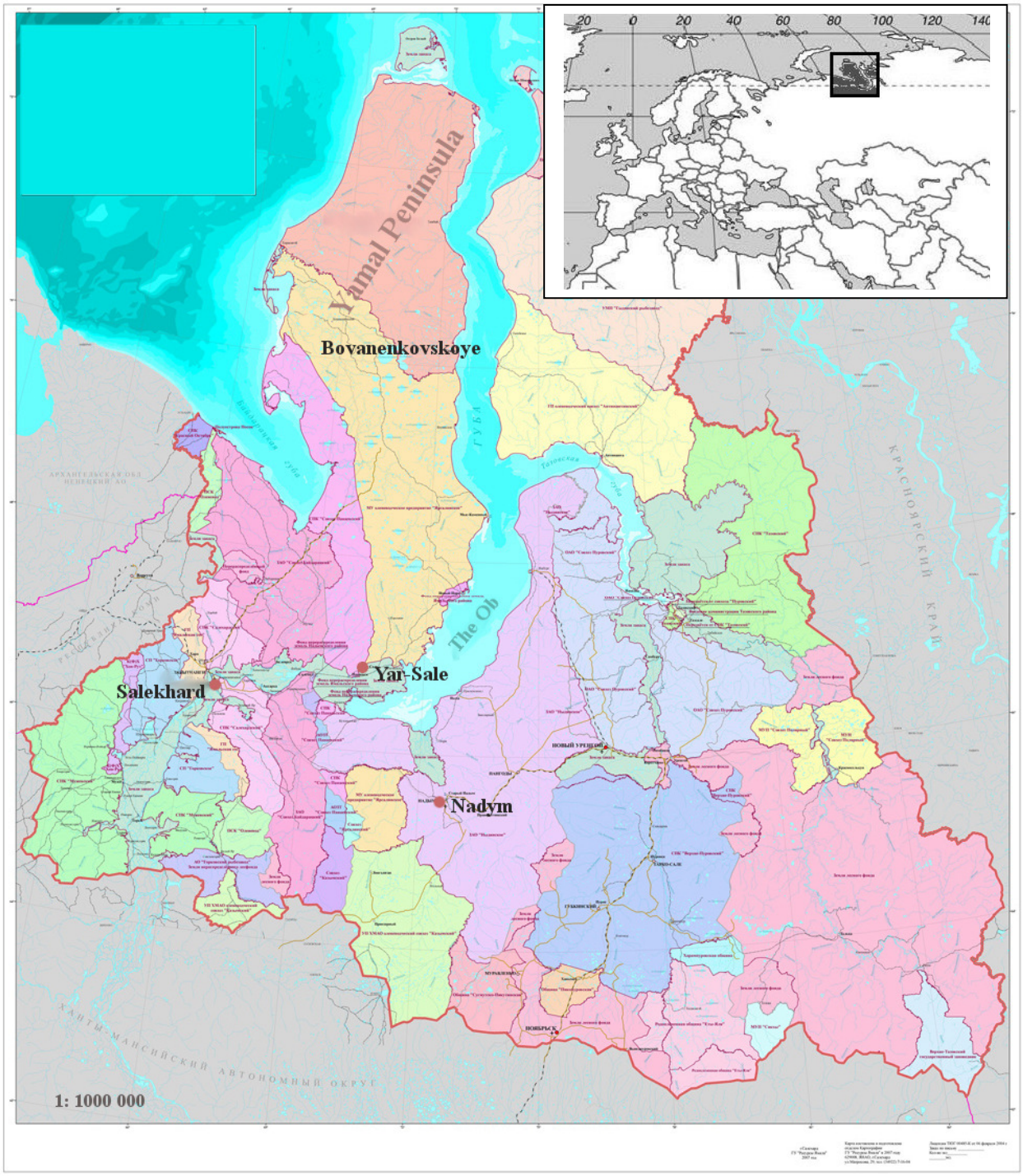
Map of Yamal Nenets Autonomous Okrug, Russia



*Modified map from the Administration of Yamal Nenets Autonomous Okrug

Map of Western-Finnmark, Norway

*Modified map from the Norwegian Reindeer Husbandry Administration

Abbreviations

ACIA – Arctic Climate Impact Assessment

GCM – Global Climate Models

IPCC – Intergovernmental Panel on Climate Change

MUP – (*Munitsipal'noe unitarnoe predpriatie*) Municipal enterprise for reindeer herding in Yamal.

UNESCO – United Nations Educational, Scientific and Cultural Organisation

UNEP – United Nations Environment Programme

YNAO – Yamal Nenets Autonomous Okrug in Russia

WIPO – World intellectual property organisation

WRH – Association of World Reindeer Herders

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CHAPTER 1 INTRODUCTION

1.1 Reindeer pastoralism and climate change

Reindeer pastoralism is an indigenous circumpolar livelihood involving more than 20 different indigenous peoples around the entire Arctic and sub-arctic area, in the countries of Norway, Sweden, Finland, Russia, Mongolia, China, Alaska, Canada and Greenland. The livelihood involves approximately 100,000 people and 2,5 million[1] semi domesticated reindeer (*rangifer tarrandus*) grazing on natural pastures covering an area of around 5million km² stretching from the North Sea to the Pacific Ocean (McCarthy et.al. 2005: 965), an area which amounts to 10-15% of the entire land area of the world.

Reindeer pastoralism is a nomadic livelihood. This is due to the strategy of securing forage for animals entirely through natural pastures. Reindeer herders generally follow the migrational patterns of reindeer from summer pastures often in coastal grass areas, to winter pastures often in lichen covered inland areas (WRH (Association of World Reindeer Herders) 1999). The nomadic characteristic has enabled reindeer pastoralism to make use of the barren arctic mountain and tundra areas for valuable food production. An area which no other land based industries have, until recently, been willing and able to adapt to (WRH 1999). Reindeer pastoralism' significance as a secure food reserve and as a base to harvest other marginal natural resources has therefore played an important role for the settlement patterns in the arctic and sub-arctic areas (WRH 1999: 3). On the other hand, the character of reindeer pastoralism means that the livelihood is "strongly dependent on natural pasture resources and the functioning and productivity of the ecosystems" (Burkard and Müller 2007: 14).

The native Arctic and Sub arctic regions of reindeer pastoralists have been, and continue to be, exposed to climate variability and climate change causing major changes in the physical environment (ACIA 2004). The IPCC fourth Assessment

[1] Figures from CAFF (2006).

report states that *"The Arctic is in the early stages of a manifestation of a human-induced greenhouse signature" (*Anismov et. al. 2007: 656), and it is projected that the Polar Regions will experience faster and more extreme climatic changes than any other regions on earth, a trend known as "polar amplification" (McBean et. al. 2005; Anismov et. al. 2007). Projections estimate an aerially averaged temperature increase ranging from 2° C to 9° C by year 2100, depending on which model and scenario is used (Anismov et. al. 2007). Annual mean Arctic precipitation is projected to increase by 10-28% by year 2100 (Christensen et. al. 2007).

Indigenous subsistence lifestyles, including reindeer pastoralism, are identified as being likely to be adversely affected by a changing climate (ACIA 2004; Anismov et. al. 2007). More specifically, O'Brien et. al. (2004:211) recognize that Sami reindeer herding may "be in jeopardy under climate change [as] increased temperatures followed by changes in vegetation may limit the availability of forage for reindeer ... ".

Arctic indigenous communities have, however, shown great resilience and adaptability to climatic variations (Anismov et. al. 2007: 674). In the case of reindeer pastoralism, history is rich in examples of how herding strategies have enabled the livelihood to adapt to climatic variations in the past (Tyler et al. 2007). Sámi reindeer herders[1] oral parlances also give an indication that reindeer pastoralism is based upon a continuous adaptation to a changing environment. The parlance *jahkki ii leat jagi vieljja* (one year is not another's brother) (McCarthy et.al. 2005) shows that no year is identical to the previous year when it comes to climate, weather, snow conditions. Another Sámi parlance *eai beivvit leat baddjalaga muhto maŋŋalaga* (the days are not on top of each other but after one another) suggests that one day fits into another but is not necessarily copied by the other. One day forms the basis for the other concerning weather (what type of weather can be expected the following day) and pastures (what has been used so far and what can be used the following day).

[1] These parlances are used by Sámi reindeer herders of Western Finnmark and may not necessarily be general for all Sámi reindeer herders in Fenno-Scandinavia

At the same time as the climate is changing, the political and social spheres in the Arctic and Sub Arctic regions are changing. The IPCC 4th Assessment report identifies that socio-political changes have already had a compromising effect on traditional responses on environmental changes (Anismov et al. 2007: 674). Increased activity in reindeer herding areas following from energy production and otherwise increased industrial activity in the Arctic could bring forth greater and more rapid socio-political changes than experienced before, which in turn may affect the resilience of reindeer pastoralism. Combined with the fact that projected climate changes seem to be more severe than climate variability in the past suggests that resilience in the past does not necessarily guarantee resilience in the future.

1.2 Research question

This thesis aims to determine the role of the social organisation of reindeer pastoralism in securing resilience for the livelihood, and further to determine how the institutional setting affects this role, focusing in particular on institutional constraints and opportunities affecting nomadic movement. The aim is sought by comparing the social organisation of two nomadic reindeer herding peoples: the Nentsy of Yamal-Peninsula (hereafter, Yamal) in Yamal-Nenets Autonomous Okrug (YNAO), West Siberia, and; the Sámi of Western Finnmark in Northern Norway.

This thesis investigates the aforementioned aim through the following two related research questions:

> *1: How is resilience embedded in the social organisation of reindeer pastoralism?*
> *2: Do institutional constraints and opportunities affect resilience embedded in the social organisation of reindeer pastoralism.*

"Social organisation" refers to the internal social organisation of reindeer pastoralism, as captured by the *siida* in Western Finnmark and the *brigade* in Yamal (see chapter 4).

"Resilience" refers "the capacity to lead a continued existence by incorporating changes" (Folke et. al. 2002: 352). Folke et. al. (ibid) argue that in coupled social-ecological systems resilience is embedded in four key factors: learning to live with change and uncertainty, nurturing diversity for reorganisation and renewal, combining different types of knowledge for learning, and opportunities for self-organisation. This thesis explores resilience though the use of the first three factors. The fourth factor, opportunity for self-organisation, refers to the degree to which central management facilitates the opportunities for social-ecological systems to self organise. This factor is thus not under direct control of pastoralists. The effects of such 'outside' factors will, in this study, be explored through the lens of institutional constraints and opportunities.

In the context of this study, institutional constraints refer to outside factors constraining herders' freedom of action. Institutional opportunities, on the other hand, refer to outside factors facilitating herders' freedom of action. These are investigated in order to gain an indication how non-climate factors may influence reindeer herders' ability to adapt to a changing climate.

The research questions require a two-step analysis: First, a study of how the social organisation contributes to the resilience of reindeer pastoralism is required. This is meet by investigating the structure and mechanisms of the *siida*/*brigade* system, according to the abovementioned factors of resilience. Secondly, an analysis of how the factors of resilience following from reindeer pastoralism social organisation are affected by institutional constraints and opportunities is necessary. This part is fulfilled by investigating the institutional context in both of the affected regions focusing on factors relating to nomadic movement.

1.3 Project Background

The history of arctic indigenous peoples, in particular nomadic societies, is a history of continuous adaptation to varying climate, accompanied by continuous adaptations to fluctuating socio-political environments. The simple fact that nomadic societies in the North have been capable of maintaining their livelihood and culture from time immemorial to the 21st century, through enormous political shifts in their respective countries, shows that these societies hold the ability to observe and analyse changes, and incorporate changes into their livelihoods. In other words, the continued existence of reindeer pastoralism indicates that the livelihood has been resilient to changes in the socio-economic environment in the past (Tyler et al. 2007).

Berkes and Jolly (2001:9) argue "The Arctic Community is an environment in which biological production is relatively low, resources are patchy, and resource availability is unpredictable. These conditions have a profound influence on social organisation because adaptive pressures are against large social groupings and permanent settlement in favour of small groups and a high degree of mobility". Perhaps this helps to explain why societal organisation shows similarities throughout the entire Arctic indigenous population (Henriksen 1994; Oskal and Sara 2001), also among reindeer herding people. Reindeer pastoralism is almost identically organised, through work communities, wherever it is practiced (Turi 2002), through an organisational structure which seems to have developed and passed on since time immemorial. The argument put forth by this thesis is that the method of social organisation has given herders the freedom to determine the structure and size of the herd according to the available natural resources, to determine the best strategy for migration and otherwise organise their work in a resilient and adaptive manner. The flexibility of this, apparently simple system, is therefore an important factor in ensuring resilience for the livelihood (Turi 2002).

The general secretary of Association of World Reindeer Herders (WRH) argues: "nothing is liable to arouse more disturbances within reindeer husbandry than encroachments in its internal organisation" (Turi 2002:71). Changes in the internal

organisation have effects on the established effective mechanisms which might cause serious disturbances throughout the pastoralism. Constraints on the freedom of action of herders threaten the resilience of reindeer husbandry and have therefore great implications for the vulnerability of these systems (Tyler et. al. 2007). Constraints on the freedom of action of herders may be caused by many types of factors; some of these being pollution, predation, loss of pastures, and last but not least, the socio-political environment (McCarthy et. al. 2005).

The potential negative impact of the socio-political environment on resilience of indigenous communities is widely recognized, most prominently by the IPCC fourth assessment report and by the Arctic Human Development Report (Anismov et. al. 2007: 674; Young and Einarsson 2004: 230). Studies have been conducted to show different ways in which these effects take place. Reinert (2006), for example, argues that the powers of state and oligopolies in Norway have caused a drastic reduction in income experienced by Sámi reindeer herders, a reduction which has without a doubt had an effect on the resilience of the livelihood. This thesis argues that the difference in the socio-political environments of Yamal and Western Finnmark are responsible for different effects on the resilience of the reindeer pastoralism in the two areas.

1.4 Delimitation of the study

The research question suggests a comparative approach. The aim of this study is not a general cultural study of the Sámi nor the Nentsy. Instead this study investigates the social organisation of Nentsy reindeer pastoralism in Yamal, and Sámi reindeer pastoralism in Western Finnmark. In-depth studies of the Sámi reindeer pastoralism are provided by the work of, among others, Paine (1994) and Sara (2001). Studies of the Nentsy reindeer pastoralism are available through the work of, among others, Ravna (2002) and Stammler (2005).

Further, this thesis will not investigate all aspects of institutional constrains and opportunities. Rather, this thesis will focus on factors affecting nomadic movement. This delimitation is necessary in order to meet the resource limitations of a master

thesis. Nomadic movement is chosen because it represents a central theme is the resilience of reindeer pastoralism.

1.5 Outline of the thesis

The remaining parts of the thesis are organized according to the following structure:

Chapter 2 presents climatic data relevant for this thesis, including historical climatic conditions and projections for the future. The final section of this chapter provides a speculative analysis of potential effects on reindeer pastoralism following from projected climate change.

Chapter 3 introduces the theoretical framework applied by this study by discussing vulnerability theories but focusing on resilience of coupled social-ecological systems. Further the theoretical perspectives of institutional constraints are discussed.

Chapter 4 highlights the methodological approaches of this project, discussing the research strategies and data collection methods used by this study.

Chapter 5 provides a general presentation of the organisation of reindeer pastoralism in Yamal and in Western Finnmark. It provides a short background to the two indigenous peoples studied, the territories in which they practice reindeer herding, the formal administrative framework for reindeer pastoralism and the social organisation through which reindeer herding takes place.

Chapter 6 presents the organisation of the specific reindeer herders units this study is based on, namely *Brigade* no. 8 of the Yar-salinskii enterprise in Yamal, and Favresordda *siida* in Western Finnmark. It presents the structural organisation, herding and migrational practices and the legal and political environment in which Favresordda *siida* and *Brigade* no. 8 operate in.

Chapter 7 provides findings of resilience following from the social organisation of reindeer pastoralism though presenting key organisational features and strategies used in Yamal and in Western Finnmark.

Chapter 8 discusses the findings of chapter 6 in the context of institutional constraints and opportunities. The chapter identifies constraints and opportunities for nomadic movement posed by the current institutional settings of both areas, and how these are likely to affect reindeer pastoralism though the climatic changes projected to occur over the near future.

Chapter 9 provides an overview of the conclusions that can be drawn from this study. Further chapter 9 discusses the implications as well as limitations of these conclusions and the knowledge gaps remaining, and suggests research strategies to fill this knowledge gap.

CHAPTER 2 CLIMATE VARIABILITY AND CHANGE

2.1 Introduction

An effective analysis of resilience to climate change requires an indication of both past climatic condition and like future conditions. This chapter presents available analysis of past climate in the Arctic and locally in Yamal and Finnmark. Further, this chapter presents projections for future climate change regionally in the Arctic and locally in Yamal and Finnmark. Finally, the last section of this chapter discusses the potential impacts of projected change on the reindeer pastoralism of Yamal and Finnmark.

2.2 Available analysis of climate in reindeer herding areas

The Arctic Climate Impact Assessment (ACIA) is a comprehensively researched and independently reviewed evaluation of Arctic climate change and its impacts for the region and for the world. The project was guided by the intergovernmental Arctic Council and the non-governmental International Arctic Science Committee. More than 250 scientists participated in the study over a span of four years. The assessment represents the, so far, most comprehensive evaluation of past trends and future projections for the Arctic climate as a whole.

However, Arctic climate is far from homogenous. The Arctic is characterised as a "collection of regional climates with different ecological and physical climatic characteristics" (McBean et. al. 2005). General analysis of the Arctic at the regional scale is therefore not sufficient by itself to indicate climatic trends at the local level.

Downscaling regional sceneries to the local level is at the preliminary stage for most areas. Limited data availability, in terms of few long-term observations, is one of the major challenges for this work. At this stage, only preliminary projections for annual and seasonal temperature in Guovdageaidnu of Western Finnmark, and Salekhard in Yamal Nenets Autonomous Okrug (YNAO) are available.

2.3 Past and present climate

2.3.1 General trends for the Arctic Climate

The Arctic regions have always been characterized by substantial climate variability compared with the rest of the world, evident by the fact that Arctic temperature variability over the last 1.6million years has been greater than the global average (McBean et. al. 2005).

ACIA results indicate that annual land-surface temperatures in the Arctic have increased by 0.09°C/decade from 1900-2003 (McBean et. al. 2005). The general trend showed an increase throughout most of the 20th century, interrupted only by a 20 year period of widespread cooling between 1946 and 1965. Warming accelerated towards the end of the last century, indicated by the fact that the average trend for the period 1966-2003 showed a warming of 0.4°C/decade: more than four times greater than the average for the entire period from 1900-2003 (ibid).

Polar amplification (grater temperature increase in the Arctic compared to the earth as a whole) is a result of feedback processes, which amplify temperature changes in the Arctic compared to the global average. Evidence of it depends on what time scale is used. ACIA recognises that it is "possible" that there has been polar amplification during the last 100 years, but "probable" that it has occurred during the last 50 years. (ibid: 23). The terms "Possible" and "probable" refer to the degree of confidence in the findings[1].

The consequences of the temperature increase over the past 80 years are identified as increased frequency of mild winter days, changes in the timing of river-break ups, changes in the frequency and severity of extreme ice jams, changes in floods, and low flows and changes and in aquatic systems (ibid: 23).

[1] ACIA developed a 5-tier lexicon describing the likelihood of change. These are: "very unlikely" or "little chance"; "unlikely" or "some chance"; "possible"; "likely" or "probable", and finally; "very likely" or "very probable".

2.3.2 Climate in Yamal and Finnmark

Analysis of annual mean temperatures and snow depth in Yamal and Finnmark gives an indication of the climatic differences between the two regions.

The most accurate past climate analysis relevant for Western Finnmark is based on temperature series from Karasjok, Eastern Finnmark. This is due to the fact long-term temperature series are available for Karasjok, but not for any central locations on the winter pastures of Western Finnmark. The climate of Karasjok is, however, relatively similar to that of Western Finnmark, and can therefore give an approximate indication of past and present climate in Western Finnmark. In the case of Yamal, analysis of temperature series from Salekhard (located approx. 200 km east of the Yamal Peninsula on the bank of Ob) give the closest indication of past and present climate.

Calculations of annual mean temperatures in Karasjok and Salekhard (see figure 2.1 and 2.2) show that there is a difference in the temperatures of the two regions. The average annual mean temperature from 1961-1990 was 4,2°C lower in Salekhard than in Karasjok[1]. There has been great variation in annual mean temperatures in both regions. The difference between highest annual mean and lowest annual mean is, however, slightly greater in Salekhard than in Karasjok. In Karasjok, the difference between highest annual mean temperature (of 1,1°C recorded in 1938) and lowest annual mean temperature (of -4,9 ° recorded in 1955) is 6°C. In Salekhard the difference between the highest annual mean temperature (of -3,0°C recorded in 1995) and the lowest annual mean temperature (of -10,8°C recorded in 1902) is 7,8°C.

[1] Average annual mean temperature in Salekhard, YNAO from 1961 to 1990 was -6,6°C, while average annual mean temperature in Karasjok from 1961 to 1990 was – 2,4°C

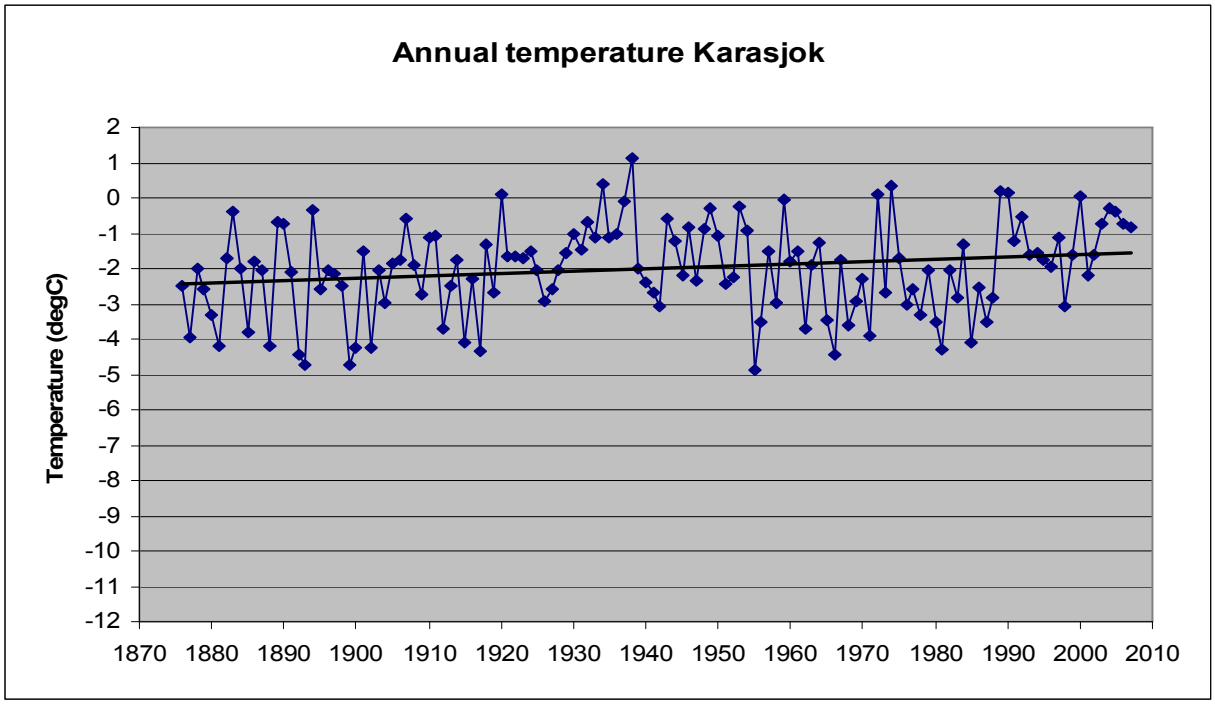

Fig. 2.1 **Annual Mean Air temperatures in Karasjok (Finnmark) (**Source: Forland, Unpublished)

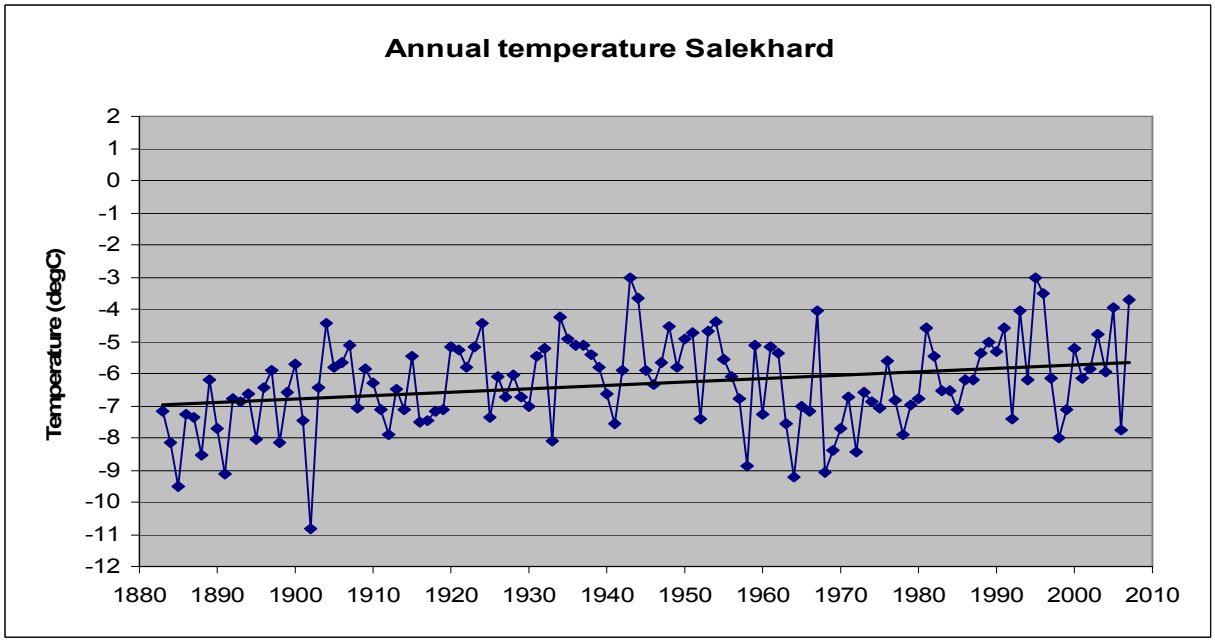

Fig. 2.1 **Annual Mean Air temperatures in Salekhard (Yamal Nenets Autonomous Okrug) (**Source: Forland, unpublished)

Kitaev's (2007) analysis of snow depths in Karasjok, Finnmark and Mys Kamenniy on eastern Yamal peninsula, also indicate distinctive differences between Yamal and Finnmark (see figure 2.2). According to Kitaev, the snow depths in Yamal from 1960

to 1994 was been 20 cm greater than in Finnmark[1]. Variation in annual snow depths, however, was considerably greater in Finnmark than in Yamal. For Finnmark the difference between the highest recording (of 96cm recorded in 1981) and the lowest recording (of 11cm recorded in 1982) is 85cm, 25cm greater than the equivalent difference of recordings in Yamal (25cm in 1965 and 85cm in 1994). Further, as is evident by observing the graphs, Finnmark has experienced more rapid changes from high annual snow depths to low annual snow depths then Yamal.

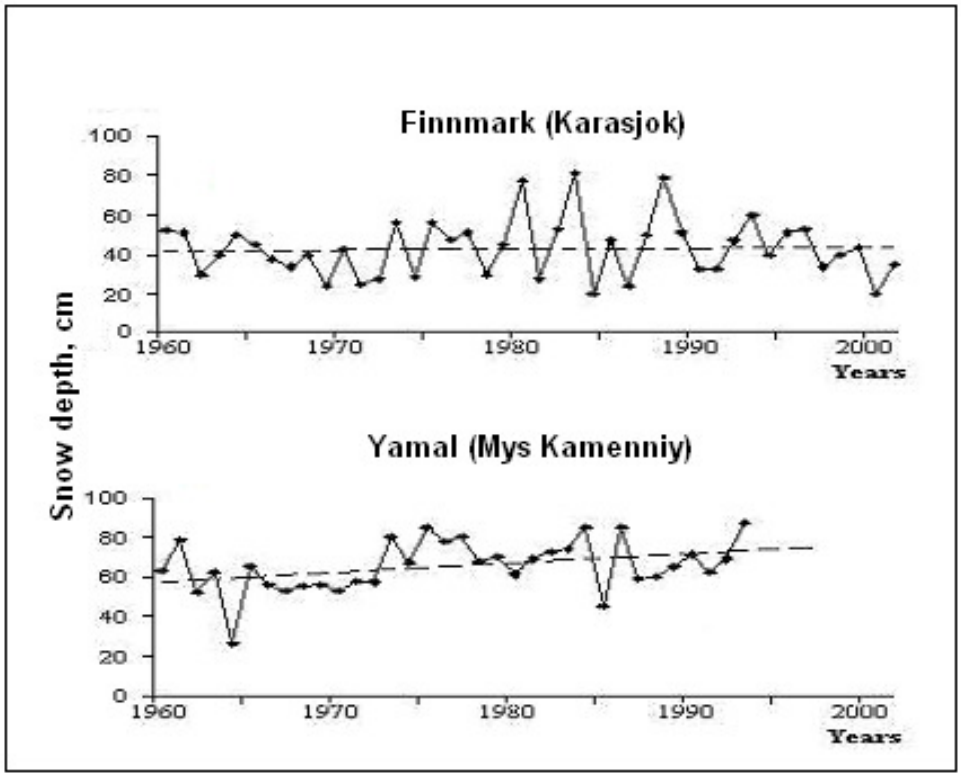

Fig. 2.3 **Snow depth in Finnmark and Yamal** (Source: Kitaev, 2007)

2.4 Projections

Projections of future climate are based on Global Climate Models (GCMs) derived from fundamental physical laws using quantitative methods to simulate the interactions of the atmosphere, oceans, land surface and ice. Such projections are widely recognized as relatively certain: "there is considerable confidence that climate

[1] Average recorded snow depth in Yamal from 1960 to 1994 was 65cm, while the equivalent figure in Finnmark was 44 cm.

models provide credible quantitative estimates of future climate change, particularly at continental scales and above" (Randall et al. 2007:600).

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At the local scale the availability of projections are limited, and it has only been possible to derive preliminary projections for annual mean temperatures. Annual mean temperatures are obviously not able to give detailed indication of day-to-day climatic developments. Yet these can provide a peak-preview of plausible general developments.

2.4.1 Arctic Projections

Regional Arctic projections as provided by ACIA (see figure 2.3) can, for an ensemble of five models, be approximated by a constant increase in annual mean temperature, where the increase depends on the emission scenario. A five model-mean forced with the B2 emissions scenario projects a temperature increase of 1,2°C between 2011-2030, 2.5°C between 2041-2060, and 3.7°C between 2071-2090 (Kattsov et. al. 2005).

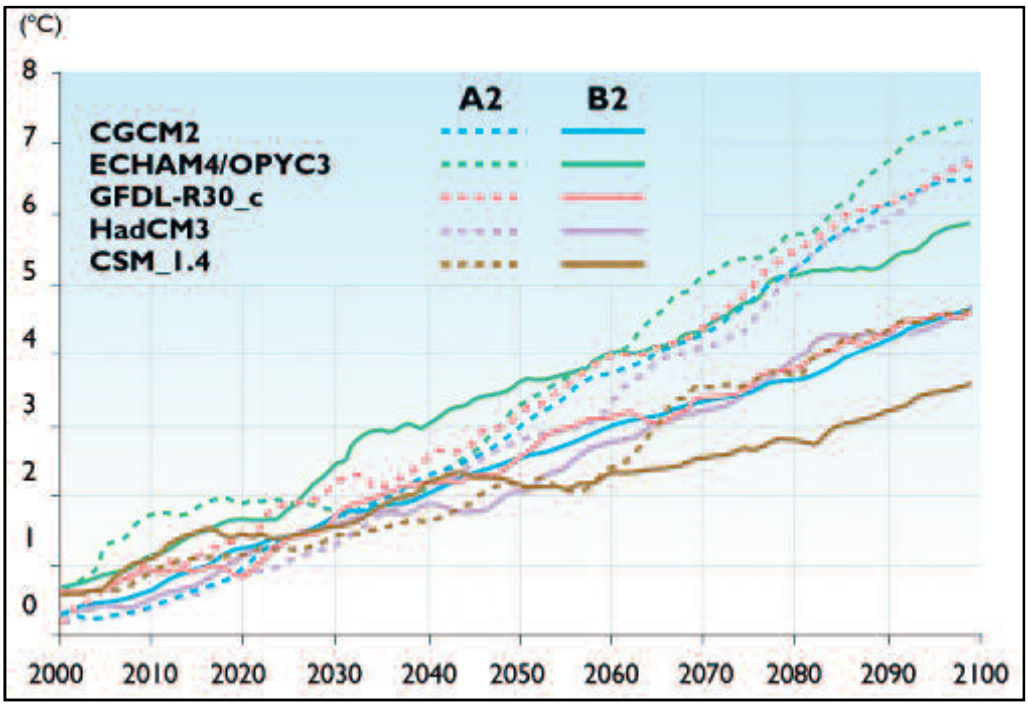

Fig. 2.4 **Changes in surface air temperature north of 60º N between the 1981–2000 baseline and 2100 as projected by the five ACIA-designated models forced with the A2 and B2 emissions scenarios.** (Source: Weller et. al. 2005)

2.4.2 Projections for Yamal and Western Finnmark

With concerns to local climate in Yamal and Western Finnmark the most relevant projections are those developed by Benestad (unpublished) (see figures 2.4 and 2.5) for Guovdageaidnu (located in Western Finnmark) and Salekhard (located approx. 200 km east of the Yamal Peninsula on the bank of Ob).

The projections were produced by using empirical-statistical downscaling, a method using statistical relationships between large-scale climatic state and local variations derived from historical data (Benestad 2004). The downscaling involves the use of all the GCMs included in the IPCC AR4 (Hegerl et al. 2007). The projections follow IPCC SRES A1b emissions scenario[1].

Both projections for Guovdageaidnu and Salekhard show steady increases in annual mean temperatures, although increase in Guovdageaidnu is slightly steeper than in Salekhard. Temperatures in Guovdageaidnu are projected to increase by about 6°C by year 2100, while temperatures in Salekhard are projected to increase by about 5°C by year 2100. Further, Inland-Finnmark is projected to get a 10% increase in precipitation at the end of the 21st century (Benestad 2008). Projections for precipitation in Yamal have not yet been fully developed.

[1] Detailed description of the methodological approach is found in: Benestad, R.E. (2005), 'Climate Change Scenarios for Northern Europe from Multi-Model IPCC AR4 Climate Simulations', in *Geophysical research letters,* vol.32, L17704, doi: 10.1029/2005GL023401. The only difference is that the different GCMs are not weighted in the below projections.

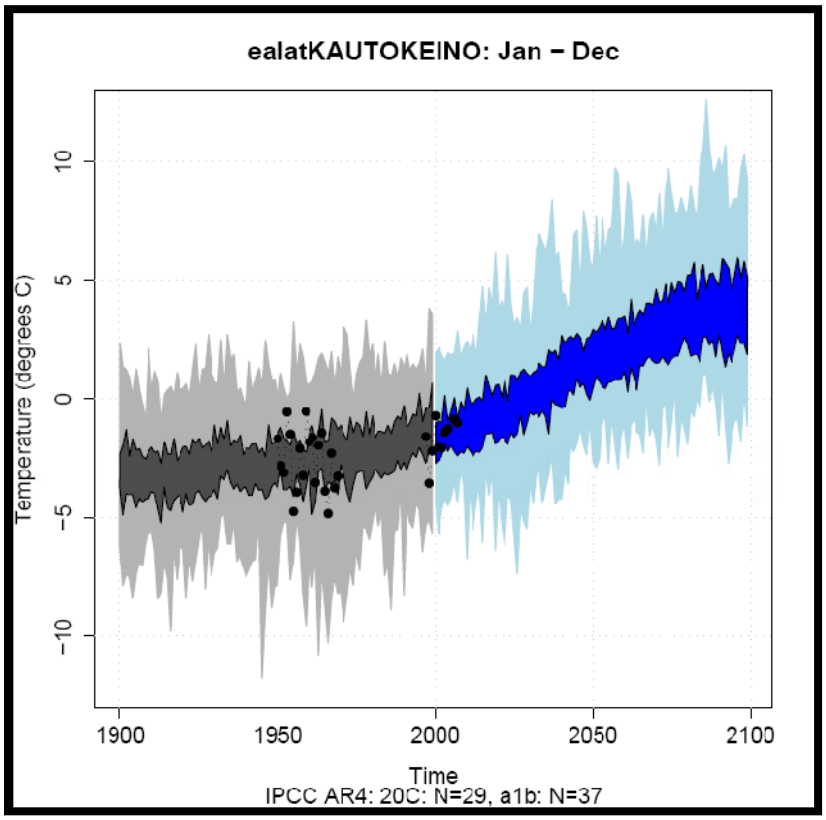

Fig. 2.4 **Projections for annual mean temperatures in Guovdageaindu, Norway 2007-2100**
(Source: Benestad unpublished)

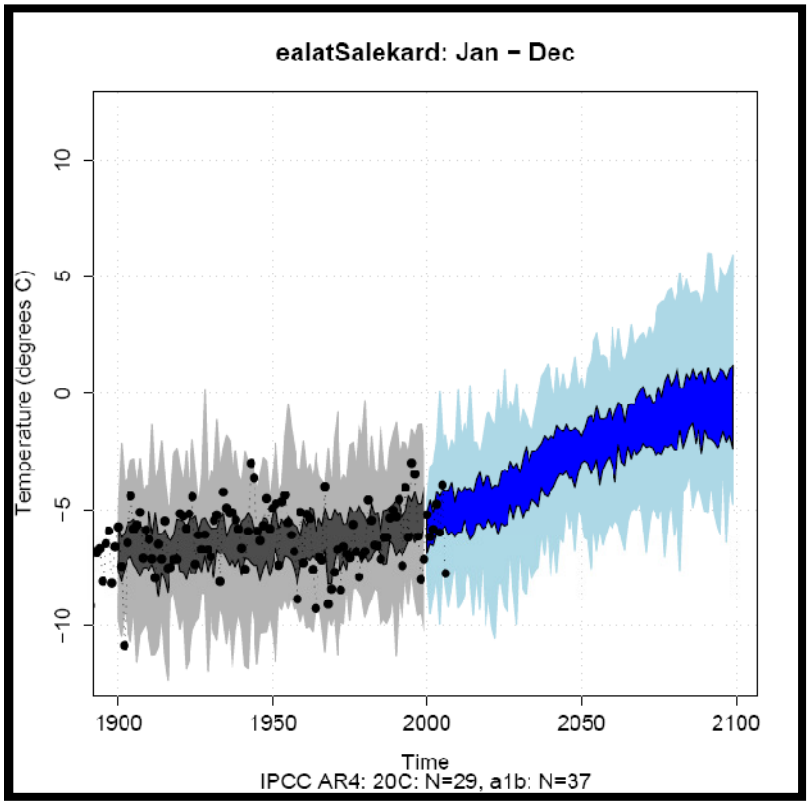

Fig. 2.5 **Projections for annual mean temperatures in Salekhard, YNAO 2007-2100**
(Source: Benestad unpublished)

2.5 Implications of projected climate change for reindeer pastoralism

The implication of the above projected future climate change is difficult to estimate. ACIA projects several general consequences of climate change. The consequences of particular relevance for reindeer pastoralism may be summarized as the following: First, Snow cover extent is projected to decrease by 13% by 2071-2090. Secondly, permafrost degradation is likely to occur over 10-20% of the present permafrost area, and the southern limit of permafrost is likely to move northwards by several hundred kilometres over the 21st century. Third, river discharge is likely to increase by an additional 5-25% by the late 21st century. And finally, the trend of earlier break-up and later freeze-up of rivers and lakes is likely to continue, consistent with the increasing temperature. (Weller et al, 2005)

The Reindeer Husbandry Administration of Norway recognises that climatic changes may have several consequences for reindeer pastoralism. The following potential impacts are mentioned: "Climate change might have consequences for availability, quality and quantity of pastures, but also for, among other things, stress caused by insects, area use, migration routes, migration times, and other husbandry relations. Climate change might also cause increasing competition for reindeer herding areas from other industries" (My translation) (Reindriftsforvaltningen, 2008).

The direct effect on reindeer pastoralism in Yamal and Western Finnmark is difficult to estimate. However, the above considerations allow for the following analytical speculations:

As mentioned above, the temperatures in Yamal have been around 4°C lower than in Finnmark. The projected increase of 5°C suggests that perhaps Yamal climate will become close to what the Finnmark climate is today. The prospects for reindeer pastoralism in Yamal could therefore be considered optimistic, as the Finnmark case shows that reindeer pastoralism is possible in such climates. Greater variation of

temperatures, abrupt and sudden changes, and permafrost degradation could, however, have unforeseen consequences for reindeer pastoralism on Yamal.

An earlier break-up of and later freezing of the river Ob could also have consequences for migration times in reindeer pastoralism of Yamal, as their winter pastures are located on the main land areas across the Ob. They would either have to delay their migrations in order to coincide with the freezing and breaking up of the Ob, or they would have to rely on transportation by boat. A situation whereby the Ob does not freeze at all would either leave reindeer herders completely depended on transport by boat or left with the choice to change migration routes such that they do not cross the Ob at all (stay on Yamal all year). It should be noted that many reindeer herders in Western Finnmark use boats for transporting reindeer to and from summer pastures, either to shorten migration routes or because their summer pasture is located on an island. As the Ob is such an extensive river, transport with large boats should not be a problem as long as the infrastructure is in place.

The reindeer pastoralists of Western Finnmark do not cross such an extensive river as the Ob on their migration route; however the earlier break-up and later freezing of rivers might have effects on migration times, and also migration routes (e.g. choosing alternative routes to avoid particular rivers). Increased river discharge could also affect migration routes, making larger rivers more difficult to cross.

In Western Finnmark the increased growth of trees may have negative impacts on reindeer pastoralism by causing more snow to be locked on pastures, and by leaving a potentially harmful cover of leaves on lichen during the autumn. Presently, Yamal is a tundra landscape with small dwarf tree species. Increased growth of vegetation caused by climate change might, however, also have consequences for reindeer pastoralism on Yamal.

Further, increased variation of temperatures could potentially affect snow quality and thus the availability of reindeer pasture both on Yamal and in Western Finnmark.

Research on the exact impacts of temperature on snow quality and pasture availability is still premature. However, some indications are available: Inger Marie Gaup Eira is a PhD candidate at the Sámi University College in Guovdageaindu. She is working on a thesis in Sámi language, terminology science and traditional knowledge titled *The secret of snow, A linguistic analysis of snow and the meaning of snow for reindeer pasturage.* She interviews Sámi reindeer herders on snow conditions and terminology. Her interviews have so-far indicated the following: variation between warm and cold temperatures affects the availability of pastures by affecting the physical properties of snow. Locked pastures, for example, may be ameliorated by extreme cold temperatures (-35°C or below) causing a process whereby the snow quality becomes as described by the Sámi term *seaŋaš,* translated by Nielsen (1979: 623) as "granular snow at the bottom of the layer of snow". This type of snow is easy for reindeer to dig through and therefore indicates good pasture conditions. On the other hand, *seaŋaš* may also be developed by the warmth of the sun. However, at latitudes the height of Finnmark the sun shine will not be warm enough before end of February (Personal communication with Inger Marie Gaup Eira, January 2008).

Herders in Yamal have recently experienced several winters where rain has caused a layer of ice on top of the snow-cover (see chapters 6 and 7), creating a situation of locked pastures. Increased temperature variation might intensify the occurrence of such incidents.

Increased activity on reindeer pastures by other industries following from improved accessibility could lead to loss of or reduced pastures. This is relevant for both Yamal, where the natural gas industry is being developed, and also for Western Finnmark, where mineral and energy industry are being developed. Indeed, herders are already experiencing loss of pastures due to industrial activity both in Yamal and western Finnmark. Loss or reduced pastures could potentially affect migration routes, herd size and the economy of reindeer pastoralism. Positive effects of increased activity are also imaginable, such as for example increased market for reindeer meat. Loss of pastures due to industrial activities is a topic that has received intensified academic attention

especially for the Yamal case (Stammler and Wilson 2006; Kumpula et al. 2006). The topic is however beyond the focus of this thesis, and will not be discussed in detail.

Summing up, climate change could impact reindeer pastoralism by affecting the availability of pastures by altered snow conditions and increased loss of pastures. Migration routes and migration times may be altered due to earlier break up and later freezing of rivers, as well as loss of pastures due to industrial activity.

CHAPTER 3 THEORETICAL APPROACH

3.1 Vulnerability, Resilience and Adaptive Capacity

The concepts of vulnerability and resilience and adaptive capacity are interrelated and have wide application to global change science (Smith and Wandel 2006: 282). These concepts represent powerful analytical tools for analysing a systems susceptibility or ability to cope with adverse effects of climate change. Vulnerability is often defined as "the degree to which a system is likely to experience harm due to exposure to a hazard" (Füssel 2007: 1). Resilience, on the other hand, refers to the magnitude of stresses a system can absorb by incorporating change (Adger et. al. 2005), in other words the ability to absorb disturbance while maintaining functions (Walker and Salt 2006). Finally, adaptive capacity refers to a systems ability to adapt if the environment where the system exists is changing (Resilience Alliance undated). The concepts are linked in an interdependent manner. Vulnerability decreases as adaptive capacity increases. Resilience and adaptive capacity are linked such that loss of resilience leads to reduced capacity to adapt (Folke et. al. 2002). This thesis explicitly investigates the potential effects of climate change on reindeer pastoralism though the lens of resilience. The interdependent characteristics of vulnerability, adaptive capacity and resilience imply, however, that the first two concepts cannot be left out of the picture.

In the introductory chapter it was argued that reindeer pastoralism has shown resilience in the past by adapting to varying climatic conditions, demonstrated by the mere fact that reindeer pastoralism continues to exist as an indigenous livelihood in the 21st century. Further it is proposed that the social organisation of reindeer pastoralism is one factor which has contributed to livelihood's resilience. This claim is investigated by how the resilience of reindeer pastoralism is embedded in its social organisation. The next section presents the conceptual framework for studying resilience of social-ecological systems.

3.1.1 Resilience and Adaptive Capacity in coupled social-ecological systems

Reindeer pastoralism may be defined as a coupled social-ecological system, in other words "a system where humanity and nature have been evolving in a dynamic fashion" (Folke et. al. 2002; 353). This notion is supported by McCarthy et. al. (2005:962) stating "Sami reindeer herding represents a tightly coupled human-environment system in which indigenous peoples interact closely with an ecosystem upon which they depend for their way of life". The study of resilience of coupled social-ecological systems requires recognition of the inseparability of the social and natural spheres. Resilience of coupled social-ecological systems operating in a natural setting where change and not stability is the norm requires, therefore, the ability to cope-with and adapt to changes without degrading options for future adaptability (Folke et. al. 2002). The distinction between 'coping' and 'adapting' is usually described as short-term coping strategies versus long-term adaptive strategies (Berkes and Jolly, 2001).

Folke et al. (2002) identify four key factors required for dealing with natures dynamics in social-ecological systems; "learning to live with change and uncertainty"; "Nurturing diversity for reorganization and renewal"; "Combining different types of knowledge for learning", and; "opportunity for self organisation". Of these, the first three factors are directly relevant for investigating resilience embedded in the social organisation of reindeer pastoralism. The fourth factor, opportunities for self-organisation, refers to the degree to which central management facilitates the opportunities for social-ecological systems to self organise. This factor is thus not under direct control of pastoralists. The opportunity to self-organise will, in this thesis, be studied through investigating the impacts of institutional constraints and opportunities.

Learning to live with change and uncertainty is imperative because change and crisis are elements of the dynamic development of coupled social-ecological systems (ibid: 356). Suppressing ecological change may lead to an escalation of crisis. Similarly, suppressing social change, in terms of institutional and organisational transformations,

may lead to a "gridlock in the capacity to adapt to change" (ibid: 356). Learning to live with change and uncertainty involves "evoking disturbance" in the social and ecological spheres as a means for development and progress (ibid: 356-358). Further, it involves "learning from crisis" in order to enhance the probability of being able to respond with experience to future crisis (ibid: 358-361). Finally, learning to live with change and uncertainty requires an ability to "expect the unexpected" by a strategy of spreading risk though diversifications of resource use patterns and alternative activities (ibid: 361-362).

Nurturing Diversity for reorganisation and renewal implies recognizing that diversity is a key factor "in the reorganisation and renewal process following disturbance" (ibid, 362). Nurturing ecological memory, defined as "the composition and distributions of organisms and their interactions in space and time … [including] the life history experience with environmental fluctuations" (ibid: 363), is a key factor in order to provide an ecological framework for coping with change. Sustaining social memory increases the likelihood of flexible and adaptive responses based on previous experience with resources and ecosystems management (ibid: 366-369).

Combining different types of knowledge for learning is important because "all forms of relevant information should be mustered to increase knowledge and understanding for improved management of complex ecosystem" (ibid: 371). Thus learning based on both *experimental* knowledge such as science, and *experiential* knowledge such as local traditional knowledge increase the likelihood of adaptation in coupled social-ecological systems (ibid: 371-372).

3.2 Institutional Constraints and Opportunities

Herders' individual and collective capacity to adapt to climate variations is dependent on herders' freedom of action (McCarthy et. al. 2005; Tyler et al. 2007). In the introductory chapter institutional constraints were defined as "outside factors limiting

herders' freedom of action". Institutional opportunities were defined as "outside factors facilitating herders' freedom of action".

Institutional constrains and opportunities are related to concept of 'opportunity to self-organise' as described by Folke et. al. (2002). The key elements of self-organisation involve the interplay between change and capacity to respond to and shape change that allows for renewal (ibid). Self-organisation is thus a key factor in the ability to incorporate change, as self-organisation allows the system to shape itself in a manner which enables it to absorb changes and maintain functions. The opportunity to self-organisation may be prohibited directly, though for example a rigid bureaucracy or legal system, or indirectly as exemplified by Folke et. al. (ibid, 377-379) "by support from socio-economic infrastructures at other scales that make it possible to maintain a business-as-usual strategy in a situation of crisis" and thereby removing incentives to self-organise.

McCarthy et. al. (2005) introduce a conceptual model for assessing the vulnerability of reindeer herding, which was developed at a five-day meeting of scientists, herders and administrators, held in Tromsø in August 2002. The conceptual model identified that "herders' ability to cope with climate-induced changes is constrained by extrinsic anthropogenic factors collectively called 'institutions and governance'" (McCarthy et. al. 2005: 971). The participants outlined four areas of constraints on herders' freedom of action: loss of habitat; predation; economic and socio-political environment, and; law (ibid). In addition, McCarthy et. al. (ibid) introduce a fifth factor potentially constraining herder's freedom of action: pollution. Further, McCarthy et al. (2005) recognize that "not all forms of governance and institutions are negative for reindeer herding [as] central administration also provides important protection and opportunities for the industry and has supported both research and education". The question of institutional and governance is, therefore, a dual question of facilitating freedom of action in some areas, while constraining freedom of action in other areas.

As mentioned in the introductory chapter, this study investigated institutional constrains and opportunities within the socio-political realm focusing on factor affecting nomadic movement. Institutional constrains such as predation, loss of habitat and pollution will not be directly investigated in this thesis.

CHAPTER 4 THE METHODOLOGICAL APPROACH

4.1 Research design

As mentioned in the introductory chapter, this thesis explores the adaptive capacities that follow from reindeer pastoralist's social organisation by focusing on the following research questions:

> *1: How is resilience embedded in the social organisation of reindeer pastoralism?*
> *2: Do institutional constraints and opportunities affect resilience embedded in the social organisation of reindeer pastoralism.*

The research strategy has been a multiple-case study approach relying on qualitative interviewing.

4.1.1 The multiple case study approach

This study uses a case study approach to achieve the in-depth focus the research question requires, and because this study focuses on "examining contemporary events … [where] relevant behaviours cannot be manipulated" (Yin 2003: 7). The case-study approach is particularly relevant for this study as "understanding the dynamic interaction between nature and society requires case studies situated in particular places and cultures" (Berkes and Jolly 2001: 1).

However, as the desire is to study general characteristics of the common type of social organisation of reindeer pastoralism, a single case study would not be appropriate. A single case study would not easily be able to separate context-specific characteristics from the general characteristics this study focuses on.

On the other hand, an in-depth study of all reindeer peoples' social organisation is not within the scope of the resources available for this type of study. In order to balance the resource limitations with the need to separate the context-specific from the general

trends, this study applies a comparative approach whereby the social organisation of two reindeer husbandries is studied.

4.2 Selection of cases and variables

4.2.1 The 'most similar' approach

The selection of cases has been based on considerations following the so-called most-similar approach. This approach is most appropriate as the focus of the thesis is to discover general similar trends in the social organisation of reindeer pastoralism. In other words, this study uses a strategy of "literal replication" whereby similar results are predicted (Yin 2003; 47).

Yet, it has been important to select reindeer pastoralism which are culturally and ethnically distinctive and which operate in distinctive socio-political systems. The Nentsy and the Sámi reindeer pastoralism were selected due to the fact that these are the two largest reindeer husbandries in the world. The Western Finnmark and the Yamal pastoralists were selected as these areas are central for Sámi and Nentsy pastoralists respectively. Yamal was also favoured before other central Nentsy areas, such as Nenets Autonomous Okrug, due to the fact that Yamal reindeer pastoralism has always included a large share of private reindeer, and because the Yamal is known as the area in Russia where reindeer husbandry exists in its most original form (Stammler 2005). These characteristics should facilitate detection of the general concepts of reindeer pastoralist organisation.

The choice of the specific units studied through this thesis, *Brigade* no. 8 of the Yar-salinskii enterprise, and Favresordda *siida* of Western Finnmark was based upon several considerations. *Brigade* no. 8 has the single largest heard on Yamal, and the members have a reputation of being good and knowledgeable herders. Further, *Brigade* no. 8 have a proven record of successful work with foreigners, even on short visits (several research and media teams have stayed with the *brigade*), and the members are known for being intellectual and talkative. These considerations were

important for the purposes of this study as it was important to find informants who are willing to discuss abstract concepts such as resilience to future change.

In Western Finnmark it the choice of unit was based on comparability with *Brigade* 8 in terms of size and availability of knowledgeable and experienced informants. Favresordda *siida* represents one of the largest *siidas* in Western Finnmark, and was therefore considered appropriate for comparison with *brigade* no. 8.

4.2.2 Indicators of Resilience

This study adopts three of indicators for resilience developed by Folke et. al. (2002): Learning to live with change and uncertainty; Nurturing diversity for reorganisation and renewal; combining different types of knowledge for learning. The use of these indicators is based on the presumption that the above mentioned factors are general for social-ecological systems, and therefore also applicable for reindeer pastoralism.

4.2.3 Indicators of institutional constraints and opportunities

Institutional constraints are, for the purposes of this thesis, defined as outside factors which constrain the herders' freedom of action. Institutional opportunities are, on the other hand, defined as institutional factors facilitating herders' freedom of action. This study has relied on interviews with herders in order to determine which factors are relevant. In addition, literature review has given a general indication of which socio-economic effects have an impact on reindeer pastoralism. This approach is appropriate for studying social-ecological resilience as "research of this type must be created through a process by which researchers and local stake holders interact to define important questions, relevant evidence and convincing forms of argument" (Berkes and Jolly 2001: 1-2).

4.3 Data collection

4.3.1 Qualitative interviewing and participatory observation

One of the data collection approaches of this study was structured in-depth interviews with key informants. The choice of informants has been strategic, based on the considerations of the need for interviewees who are experienced and knowledgeable.

For the Yamal case, primary data collection was conducted through participatory observation and structured interviews with members of *Brigade* no. 8 through a period of three weeks, during first part of their spring migration in March and April 2007. Participation in the annual reindeer herders' celebration in Yar-Sale, 1-5th of April provided an additional opportunity to talk with members of other *brigade*s, and thus gain, at least a limited insight, into the practices of other *Brigade*s.

Additional interviews were conducted with key informants in Salekhard, April 2007, and December 2008.

For the Western Finnmark case data collection was primarily conducted through structured informal interviews in fall 2007 and early 2008.

4.3.2 International workshops with reindeer herders, scientists and administrators

In addition to interviews data collection has also relied upon 3 international workshops with reindeer herders, scientists and administrators. These were: EALÁT workshop 1 in Guovdageaidnu, February 2007; EALÁT workshop 2 in Nadym, YNAO, March 2007, and; EALÁT workshop 3 in Yar-Sale September 2007. Lectures and presentations given by reindeer herders, scientists and public officials provided essential empirical data and analysis relevant for this study.

During these workshop the research topic and design of this study was also presented to the participants. The subsequent discussions provided an opportunity to get inputs form the participants and were greatly beneficial for the conduct of this study.

4.3.3 Legal and political documents

In addition to interviews and workshops, analysis of legal and political documents has provided the empirical foundation for describing the institutional setting in Yamal and Western Finnmark. The relevant documents are listed as 'sources' in the bibliography.

4.4 Other reflection around the work with the thesis

Throughout the data collection process one major challenge emerged which might have influenced the reliability of this study: Due to the investigator's lack of command of Russian or Nenets, the interviews in Yamal were only possible through the use of a translator. Communication through a third party increases the inclination towards misunderstandings. Efforts were made to eliminate the potential misunderstandings by asking the several questions around the same topic, asking different informants the same questions, and, where possible, verifying data against other sources.

During field-work in Yamal, a learning utility in the form a book of pictures developed by EALAT, facilitated discussions around issues concerning reindeer pastoralism. The use pictures as a reference point encouraged more herders to join the debate, and facilitated in-depth debates around different topics. The use of creative learning-aids could benefit studies conducted in areas where communication and language presents a challenge.

4.4.1 Native-to-native approach

The performance of this study has been facilitated by the investigator's background from the reindeer pastoralism. Solbakke's (2007) observation, that knowledge and use of the reindeer herding terminology and concepts is beneficial in order to formulate relevant question, as well as to encouraging the informants to give more elaborate answers, certainly applied to this study as well.

On the other hand, the question of objectivity is central when an indigenous person studies indigenous people, and especially in this case, where a member of the reindeer husbandry, representing a 'minority within the minority', studies her own livelihood.

It should be principally rejected that indigenous persons cannot study indigenous peoples, or that members of small groups cannot study their own population. This is due to the fact that such approach would disable to benefits associated with an in-depth cultural knowledge of the phenomena studied.

However, the problems of objectivity in this type of research should not be ignored. The comparative approach of this study represents one strategy to reduce subjectivity. The choice of the cases and choice of specific herding units studied were, among other things, based on a strategy of limiting inclinations towards subjectivity. In addition, the strategy of having several advisors, including one with extensive knowledge of the Sámi reindeer pastoralism and another with extensive knowledge of the Yamal reindeer pastoralism also represents an attempt to diminish the inclination towards a biased study.

CHAPTER 5 THE ORGANISATION OF REINDEER PASTORALISM

5.1 The Sámi reindeer pastoralism

5.1.1 People and territory

The Sámi are an indigenous population and ethnic minority in Finland, Sweden, Norway and North-Western Russia. Their native land, often referred to as *Sápmi,* stretches from the Kola Peninsula in the northeast to Engerdal in South Norway and Idre in South Sweden. Due to statistical challenges[1], the exact population of Sámi is unclear. However estimates range from 50-80 000 individuals. Although only a minority of Sámi are involved in reindeer pastoralism, the industry has been, and remains an important aspect of Sámi culture, and the activity has strong roots in the entire Sámi population.

Approximately 7000 Sámi are involved in the herding of 600,000 reindeer in Fenno-Scandia. This makes Sámi reindeer pastoralism the second largest reindeer pastoralism in the world, after the Nentsy reindeer pastoralism. The Norwegian Sámi reindeer pastoralism involves 2700 people with 200,000[2] reindeer applying pastures spanning over 140,000km², an area which constitutes around 40% of the land area of Norway. In Norway reindeer pastoralism in Sámi reindeer herding areas[3] is legally protected as an exclusive Sámi livelihood, such that only persons of Sámi descent with a linkage to reindeer herding family can own, and hence make a living, of reindeer herding.

5.1.1.1 Western Finnmark

[1] Sámi statistics is challenging due to several reasons. The project 'Sámi Statistics' lists the main challenges as the following: Firstly, no agreement has been reach on a definition of Sámi. Secondly, assimilation policies in all 4 countries have contributed to several Sámi hiding or surprising their ethnical background. Finally, there have not been preformed systematic censuses of Sámi in the Nordic countries (the All-Russian population census of 2002 recorded 1,991 Sámi in Russia). For more information see www.sami-statistics.info

[2] Figures from 2007

[3] Most reindeer pastures in Norway are defined as Sámi reindeer herding areas, where only people of Sami decent are allowed to practice reindeer pastoralism. Areas in southern Norway are not, however defined as such. Here there is a small reindeer husbandry Norwegian herders, who rent the pastures used from private owners.

The area of Sámi reindeer pastoralism of focus in this thesis, Western Finnmark (69°N/23°E)[1] is located in northern Norway. Winter pastures of western Finnmark are located in the municipality of Guovdageaidnu, a municipality inhabited by around 3000 people, of which 80% are of Sámi descend. The municipal centre, the town of Guovdageaidnu is one of the largest Sámi dwellings. The municipality is also a central for Sámi reindeer pastoralism holding around 80,000[2] reindeer on winter, spring and autumn pastures, and involving some 1300 people. During the summer, reindeer pastoralists migrate to different coastal areas in Western Finnmark and some to coastal areas of Troms.

5.1.2 Social organisation of Sámi reindeer pastoralism

The unit of social organisation in the Sámi reindeer pastoralism is the *siida.* A *siida* can be defined as "an organisation of households who cooperate on herding supervision of the reindeer herd" (my translation) (Oskal and Sara 2001: 302). The members of a *siida* work and migrate together, sharing the duties associated with reindeer pastoralism. As the definition suggests, the *siida* is made up of units of households. The household is usually made up of the core family and perhaps some hired help, but may, however, also be composed of close relatives (Oskal and Sara 2001). The households are independent units responsible for their own subsistence economy and equipment, and where the members individually own reindeer and have individual ear marks[3] (Oskal and Sara 2001).

A *siida* is often made up of siblings or relatives. However, family ties are not a prerequisite for a *siida* constellation. There are indeed many *siidas* whose members are not related to each other. Therefore, as argued by Oskal and Sara (2001: 303), "The kinship network does not represent an attribution of *siida*-belonging, but rather, in the words of Pain (1970), a strategic merit" (my translation).

[1] coordinates for the administrative centre of Guovdageaidnu municipality, Guovdageaidnu
[2] 2003 figures from the Norwegian Reindeer Husbandry Administration
[3] The ownership of reindeer is identified through the use of earmarks. An ear mark is composed of cuts of different shapes on both ears of the reindeer. In Norway, the earmarks are legal denotations of property, and all approved markes are registered by the Norwegian Reindeer Husbandry Administration.

A *siida* often has a leader, the *siida-isit* or *siida-eamit*[1]. The leader is not necessarily elected through formal elections, but is instead often the herder owning the largest share of the herd (Solem 1933).

The *siida* is not necessarily a stable constellation. More often there are different *siida* constellations throughout the year (Oskal and Sara 2001). A *siida* in winter might break up to several summer *siidas*, and vice versa.

Further, there are no assumptions of durability in the *siida* (Oskal and Sara 2001). *Siidas* may break up short-term, due to ecological considerations or mere coincidence. For example, when different herds get mixed together and a decision is made to not separate reindeer but stay together through the season. *Siida* constellations may also change permanently, due to either ecological or social considerations. Children born to one *siida* often chose to stay in the same *siida* as adults. Exceptions to this are when *siida* constillations change due to marriage. But in principle, each member is free to separate his/her reindeer from the heard whenever he/she wishes, provided, of course, that it is practically possible at that time (Oskal and Sara, 2001).

5.1.3 Allocation of pastures in Western Finnmark

The *siida* is, however, not only a work community but also, as recognised in the Norwegian official report on reindeer husbandry: "the central basis for traditional use of reindeer pastures" (my translation) (NOU 2001:35 : 11). Pastures and migration routes are allocated according to tradition-based complex system which takes into account the natural properties of the terrain and relations between *siida*.

Formally, the summer pastures of western Finnmark are divided among different groups and coined as *districts*. Winter, autumn and spring pastures in the Guovdageaidnu area are, however, only divided formally into 3 broader districts (sometimes referred to as zones): the western (district number 30A), the central (district number 30B) and the eastern (district number 30C), although plans for

[1] Isit denotes a male, while eamit denotes a female. Although *siida-isit/eamit* may also denote the spouse of whoever is the leader.

dividing these districts on the *siida* level are in process. Each *siida* belongs to one of these districts and will use pastures within these borders.

5.1.4 Formal organization of reindeer pastoralism in Norway

Reindeer pastoralism in Norway formally administered by the Ministry of Agriculture, through the administrative body 'Reindeer Husbandry Administration', located in Alta, Finnmark.

Reindeer pastoralism is formally divided into 6 reindeer herding regions. Further, the reindeer herding regions are divided into 78 reindeer herding districts. Some these are year-round districts, while some are only summer districts (this might be the case when a winter *siida* splits up to different summer *siida*). There are also some spring/autumn districts and winter districts.

Finally within these districts are several family units. These were termed operational-units (*Driftsenhet*) in the 1978 Reindeer Husbandry Act[1]. An operational unit is defined as a "herd of reindeer owned and managed by one responsible leader, or collectively by parties to marriage" (Reindeer Husbandry Act 1978: §4). In other words, the operational unit may be viewed as the household in reindeer pastoralism.

Every reindeer herding district has a district-board, elected by the leaders of the operational units. The District board represents the interests of reindeer pastoralism in the respective district. Its duty is to attend to pastures according to laws and regulations. The leader of the district board is also elected according to the same principles.

There are two authoritative bodies above the District Board. First there is the Regional Board (*område styret)* whose members are appointed by the county council (*fylkesting*) and the Sámi Parliament. The regional board is a professional advisor and

[1] The reindeer husbandry Act of 2007 uses the term *siida-share*

premise provider for the administration and in other issues of concern for the reindeer husbandry area in question.

Finally, the Norwegian Reindeer Husbandry Board (*reindriftsstyret*) is the superior body to the area board and the court of appeal for decisions adopted by the area boards. The Association of Sámi Reindeer Herders in Norway, the livelihood's own interest organisation, suggests members to the board. In the end, the members of the board are appointed by the Ministry of Agriculture.

In addition there is a committee for earmarks in each reindeer herding area. Its duty is to approve the registration of earmarks and changes in earmarks. The committee members are elected by the leaders of the district board, and the reindeer husbandry board acts as the court of appeal for also decisions made by this committee.

5.1.5 Legal framework for reindeer pastoralism in Norway

In Norway, reindeer pastoralism is regulated primarily by the Reindeer Husbandry Act. The 1978 version of the Reindeer Husbandry Act aims to "facilitate an ecologically sustainable use of reindeer pasture resources for the benefit of reindeer herding people and the general society … " (Reindeer Husbandry Act 1978: §1).

The Act regulates, among other things, the formal administration of reindeer pastoralism, the rights to do reindeer husbandry, property rights with regards to reindeer, and other general rules for conducting reindeer pastoralism.

In July 2007 a new and revised Reindeer Husbandry Act came into force in Norway. This was the result of prolonged work of revising the 1978 Act, an act increasingly recognised as having flaws. Proposition to the Odlesting number 25 (2006/2007) on the new reindeer Husbandry Act recognized the following:

> *The current reindeer husbandry Act [of 1978] is based on the view that the central management is free to organise reindeer husbandry in the manner which coincides with the prevailing policies. For example, it is up to the*

authorities to decide the division of districts, the allotment of operational units, number of reindeer etc, according to the framework of the law, based on what is viewed as appropriate and justifiable

(Ot prop 25 (2006/2007): 19)

The new Act contains many changes with respect to the 1978 act. For example, the *siida* is given juridical status. The effects of the Act are still difficult to determine and no evaluations have yet taken place. Informant H emphasizes: "the new law might change the situation, but it is difficult to know before it is properly in force". Field work for this study was primarily conducted before the 2007 Act came into force. This study therefore focuses mainly on the provisions of the 1978 Reindeer Husbandry Act. The 2007 reindeer husbandry Act, does, however, potentially represent an important institutional opportunity. This will be discussed further in chapter 8.

5.1.6 Economic transfers to reindeer pastoralism in Norway

Economic transfers to reindeer pastoralism are provided for by the 'reindeer husbandry agreement' negotiated annually between the Association of Sámi reindeer herders in Norway and the Norwegian Ministry of Agriculture and Food. The Sámi parliament has observatory status under these negotiations. The reindeer husbandry agreement for year 2007/2008, valid from 1 July 2007 till 30 June 2008, has an overall framework of 92,5 million NOK. These funds are divided between 4 posts: Development and investment (37,3m NOK), involving grants for research, development of subsidiary economies, efforts aimed at prevention of conflicts, women, improving marked situation, and other measures; Direct subsidies to reindeer husbandry (49,2m NOK); social welfare (1,8m NOK), involving pensions, social security and sick-pay for reindeer pastoralists, and; grants to reindeer pastoralists' NGO, namely the Association of Sámi reindeer Herders in Norway (6,2m NOK).

5.2 The Nentsy reindeer pastoralism

5.2.1 People and territory

The native land of the Nentsy is the tundra and forest tundra in the arctic regions of north-eastern Europe and north-western Siberia, stretching from the Kanin Peninsula in the west, along the banks of the on the White Sea to the Gydansk-Peninsula at the Yenisey delta. Administratively, their territory is divided between the Nenets Autonomous Okrug of the Arkhangelsk Oblast and the Yamal-Nenets Autonomous Okrug. Combined, this covers a vast territory of about 1 million square kilometres. A small population of Nentsy also lives in Taymyr, or Dolgan-Nenets Autonomous Okrug. The Nentsy number around 41,000 individuals[1] of which about one third is involved with reindeer pastoralism. Their reindeer husbandry is the largest in the world, numbering around 600-800,000 animals.

The Nentsy are officially recognized as one of the *Indigenous Numerically Small Peoples of Russia*[2]. This recognition gives them benefits according to laws aimed at preserving ethnic minorities in Russia. These benefits may include free transportation or the ability to enrol at universities without taking entrance examinations (Stammler 2005).

5.2.1.1 Yamal-Peninsula

The Nentsy area of focus in this thesis, the Yamal Peninsula (Yamal) (66 °N/ 71°E)[3], is located in North West Siberia. The peninsula is bordered by the Kara Sea, Baydaratskaya Bay on the west, and by the gulf of Ob on the east. Administratively, Yamal belongs to the Yamal-Nenets Autonomous Okrug (YNAO) of the Tyumen Oblast. Yamal is approximately 148 000km² and has around 15 000 inhabitants,

[1] Figures from the 2002 All-Russian Population Census

[2] 44 small indigenous groups have been recognized as *Indigenous Numerically Small Peoples of Russia* and are included into the *Единый перечень коренных малочисленных народов России* (Common List of Indigenous Numerically Small Peoples of Russia) approved by the government of Russian Federation on 24 March 2000. These people satisfy the following criteria; they live in their historical territory; they preserve traditional way of life, occupations, and trades; they recognize themselves as a separate ethnicity; their population does not exceed 50,000. Recognition implies a number of benefits according to laws aimed at preservation and support of these ethnicities.

[3] Coordinates for the administrative centre of Yamal, Yar-Sale

registered there, 10 000 whom are indigenous. Of these, around 5000 are involved in reindeer pastoralism. There are also a rapidly increasing number of industrial shift workers without permanent residency, but with significant impact on the tundra and reindeer pastoralism as a livelihood. Yamal holds approximately 200 000 semi-domesticated reindeer, which is 20% of the total number of reindeer in Russia. This makes the Yamal the largest reindeer herding region in the world. Most of the reindeer herders of Yamal migrate towards the north of the peninsula during the summer, and back south, crossing the Ob on to the adjacent main land forests in the winter. The migration routes are vast, known to be up to 1000 km per year between the tundra and the forest-tundra (Stammler 2005).

At the same time, the peninsula holds enormous natural gas reservoirs, including the Bovanenkovskoye field, which is the third largest gas field in Russia. Extraction of the deposits on the peninsula is planned in the near future, within the next 10 years.

5.2.2 Formal Organisation of reindeer pastoralism in Yamal

On Yamal, reindeer pastoralism exists in two forms; private and Okrug-owned through so-called municipal enterprises or *Sovkhozy*. As fieldwork for this thesis was primarily with *Brigade* 8 of the Yar-Salinskii Enterprise, this study will focus on the Okrug-owned *brigade*s, although reference to the private pastoralism will be given when appropriate.

Before the collectivisation of reindeer pastoralism in Russia, reindeer pastoralism was organised though the *Parma*, which was characterised by cooperation between reindeer herders for pooling labour (Stammler, 2005). Now this unit is referred to as the *Brigade*, a term used so widely that even private reindeer herders apply it to their organisation (Stammler, 2005). In this thesis, however, *brigade* will be used to refer to state-owned pastoralism, while *parma* will be used to denote private reindeer pastoralism.

In recent years, herders have begun organizing themselves in *obschiny* (translated as communities, but recognized by regional and federal authorities a s a unit for indigenous organisation). The *Obshiny* may be viewed upon as a "legal umbrella" (Stammler, 2005) applied as a unit for indigenous peoples to organise themselves, and seek rights to, among other things, use land areas. Private reindeer herders, or *parmas* are often organised as an *obshiny.* The organisation of *obshiny* will, however, not be the focus of this thesis.

There are three *sovkhozy* on Yamal. Of these, the Yar-Salinskii enterprise is the largest, with 21 *Brigade*s under it. These enterprises are under the control of the Okrug department of Agriculture, although "on paper they have different juridical forms of ownership" (Stammler, 2005: 80). The *sovkhoz* own reindeer, and employ, in each *brigade*, herders, so-called *chum-workers* (the wives of the herders working with household duties), a leader (*brigadier*) and sometimes a veterinary specialist (so-called *zoo-teknik*). The *brigade* also includes non-employed members, e.g. children, students, retired workers and others. The *brigade* works collectively to not only heard *sovkhoz* reindeer, but also private reindeer owned by its members. The share of private reindeer in a *brigade* is usually more than 50% (Stammler 2005).

Informant A explains that *sovkhozy* are "non-profit organisations", and further explains: "all the money earned by the *brigade* through selling meat is paid back to the *brigade* through salaries". The *sovkhozy* were constructed in order to collectivize reindeer pastoralism during the Soviet era. Their original intention was not profit-maximisation but including reindeer pastoralists in the socialist system. Nowadays *sovkhozy* are best considered as business entities with state ownership, which can and do go bankrupt[1], but are secured government funding and support.

The role of *sovkhozy* in Yamal is dominant. The rights to pastures are nominally assigned to *sovkhozy brigade*s. The *sovkhozy* also occupy a leading position in the processing and marketing of reindeer meat (Stammler, 2005). And finally, state

[1] Which was the case of for example, the Yamalski Sovkhoz in 2007 and the Yar-salinksii sovkhoz in 2001

subsidies are only granted through the *brigade* system, and not to private entities not involved in an agricultural enterprise structured like a *sovkhoz*.

5.2.3 Social organisational structure of Nentsy reindeer pastoralism in Yamal

The social organisation of Nenets reindeer pastoralism has strong structural similarities to the Sámi *siida* whereby different households work collectively to herd their reindeer, and in the case of *brigade*s, also reindeer owned by state enterprises.

When collectivisation of reindeer pastoralists in Yamal occurred in the 1930s, the *brigade*s were constructed deliberately to employ members of no kinship (Stammler 2005; Degteva 2006: 2). Nowadays, kinship ties are developing, and the children born to one *brigade* often chose to stay at the *brigade* as adults (except for in case of marriages etc.). The *parmas* are often composed of members of the same extended family (Stammler 2005).

Previously, it was normal that the richest member (the one owning most reindeer) was appointed leader of the organisation (WRH 1999), as is still the case in the *parma* (Stammler 2005). In the *brigade*s, however, the employed male members of the *brigade* (the herders) elect a *brigadier* annually. These are, however, by no means, politicized elections with frequent changes in leadership, and a skilful *brigadier* is often elected year after year. Interestingly enough, research for this thesis showed that many *brigadiers* on Yamal also own the largest private herd in the *brigade*. However, this observation is based on only a limited number of *brigade*s, and it has not been determined whether this is a general trend in Yamal.

The different households, often referred to as *chums*[1], are independent economical units, responsible for their own equipment and subsistence economy. They also own private reindeer and have an individual earmark. It is not the practice, however, that

[1] Russian term describing the tepee-like tent used by reindeer pastoralists, but also used to denote the family, or household that lives in the tent.

individual members own reindeer independently. Rather, the reindeer are owned collectively by the household members, and the earmark usually belongs to the head-male of the household. In addition, the *brigade* will supply households with transport reindeer if necessary. Families with a strong economy in terms of many private reindeer will usually prefer to tame their private reindeer for transport.

The *brigade* members are free to leave the *brigade* at any time this is practically feasible. In other words, quit their job, or change their workplace by moving to another *brigade*. However, leaving a *brigade* might be difficult as pastures are scarce and other *brigade*s might be unwilling to employ new member. As explained by Informant (A), "Of course you can leave the *brigade*, but where would you go?". The *brigade* is therefore a relatively stable constellation. The constellation of the *brigade* is also stable throughout the year, as the *brigade* migrates collectively from the summer pasture to the winter pastures, year after year. This represents a crucial difference between the *brigade* and the *parma*, as *parmas* often merge to larger units during the summer while staying in smaller units during the winter (Stammler 2005: 195).

5.2.4 Allocation of Pastures on Yamal

Also in Yamal, pastures and migration routes are divided according to a complex system taking into account natural properties of the terrain and relations with other *brigade*s and *Sovkoz*.

Stammler (2005) describes the role of pasture distribution system and the role of the *sovkhoz* as following:

> *On paper, the state owns most of the land, including the whole of the Yamal Peninsula, which remains split among three sovkhozy that hold the only long-term land titles. Gas companies hold land titles over deposits for a limited time. The sovkozy still have the same Soviet title of 'bessrochnoe pravo pol'zovaniia' (unlimited use right), and on paper the territories assigned to reindeer and hunting brigades still exist. This shows that*

> *although the central framework has gone, the sovkhoz system in Yamal, controlled by the Okrug administration, is still the main organising principle within reindeer herding.*
>
> (Stammler 2005: 239)

Division of pastures among municipal-enterprises on Yamal were set in 1961. Informant E explains that "The most important boarder is the one set between the different *sovkhozy* on Yamal. It is important that the different *sovkhozy* remain within their pasture boundaries. Within the assigned pasture areas, however, it is the responsibility of the *sovkhoz* to assign and adjust pastures according to the needs and customary pattern of the different *brigades*". The *sovkhozy* have assigned winter, summer and autumn pastures, as well as migration routes for all *brigade*s. There are no set dates for when the different seasonal pastures are to be entered or left. Informant B explains, however: "in order to facilitate smooth migration with minimal risk of herds mixing together, the *brigadiers* will meet during spring and autumn to agree on when the different *brigade*s will migrate through the specific pastures". On these meetings dates for when each specific *brigade* will migrate over the Ob are set, as well as dates for when reindeer will be gathered in coralls for counting.

The private reindeer herders, or *parmas*, are not allocated pastures according to the above maps. Informant (Q), a private reindeer herder, explains "I used to migrate after the *brigade*s, using land areas which are not occupied by them.". Private reindeer herders are not assigned formal rights to pastures and are often left to juggle between the pastures left by *brigade*s.

5.2.5 Legal framework for reindeer pastoralism on Yamal

Reindeer pastoralists of Yamal are subject to laws of two levels: the regional laws of Yamal Nenets Autonomous Okrug and the Federal Laws of the Russian Federation.

On the regional level, YNAO adopted a law on reindeer herding in 1998 aiming to "secure legal and economic protection, protection of the nature and a social basis for

reindeer husbandry …" (YNAO law no. 46 1998: §1). This law regulates, among other things: who has advantageous rights to practice reindeer pastoralism; property rights with regards to reindeer and reindeer products; the right of reindeer herders to hunt predatory animals; the formal control and reporting processes in reindeer husbandry; social guarantees, compensations, insurance and pensions for reindeer herders and their family members; rights and obligations and allotment of reindeer pastures, and; state support to reindeer pastoralism.

In addition there are several regional laws in YNAO directly or indirectly relevant for reindeer pastoralists concerning the welfare and activities of indigenous minorities. These are laws on issues ranging from housing, social security, local trading station to cultural heritage. Of these, two laws are worth special attention: law 114 of December 2005, *on state support to traditional communities* and law 49 of October 2006 *on the protection of the original habitat environment and traditional ways of living of the indigenous minority peoples of the north.* Law 114 regulates "the legal basis and types of state support of traditional communities" (§1) including clarification of which financial sources may be used for support of traditional communities. Law 49 "secures the indigenous rights of the minority peoples of the north living on the territory of the autonomous area" (§1) and clarifies the authority and responsibility of regional state authorities to protect the original habitat of indigenous minorities.

On the federal level, reindeer peoples of Russia have been struggling for the last decade to ensure the adoption of a federal law on reindeer pastoralism, similar to the regional law of YNAO. Such law has, however, yet to be adopted. Until then, the laws most relevant for reindeer pastoralism are those concerning indigenous rights and traditional habitats.

There are three framework laws at the federal level aiming to securing the rights of indigenous peoples and the territories of traditional use of nature: *On the Guarantees of the Rights of Numerically Small Indigenous Peoples of the Russian Federation,* signed by President Yeltsin 20 April 1999; *On the general principles of the*

organisation of the communities (obshiny) of the Indigenous Numerically Small Peoples of the North, Siberia and the Far East of the Russian Federation, signed by president Putin 20 July 2000, and finally; *On the Territories of Traditional Nature Use of the Indigenous Numerically Small Peoples of the North, Siberia and the Far East of the Russian Federation*, signed by President Putin 7 May 2001. Degteva's (2006: 35-39) study of these laws indicates that they do comply with international standards for indigenous rights, but that these laws are not effectively implemented in Russia. Degteva (ibid: 39) argues that due to the internal problems with the laws and the fact that they contradict with other federal legislation "authorities [are able to] manoeuvre around and thus avoid prioritising indigenous issues while still claiming to follow the law". The impact of federal laws on the daily life of reindeer pastoralists on Yamal may therefore be difficult to predict.

5.2.6 Economic transfers to reindeer pastoralism in Yamal

As mentioned above YNAO law 114 of December 2005, *on state support to traditional communities* regulates the types of state support to traditional communities in Yamal. This law provides that state support is given to "traditional communities of the indigenous minority peoples of the North … [and] organisations which perform traditional economic activities" (YNAO Law no. 114 2005: § 4). The ways in which support is granted and the amount allocated is approved annually by the State Duma of YNAO.

The law on reindeer herding (YNAO Law no. 46 1998) specifies that state support to reindeer husbandry is given in several ways: annual subsidies to reindeer products; compensation for expenses in connection with transport of reindeer products; aviation services during transfer to reindeer pastures; support to processing or reindeer raw materials; help with development of modern technology and with developing storage systems for products; help to acquire professional training, and; support for communication equipment and other equipment necessary for the existence of reindeer herders' (YNAO Law no. 46 1998: §27).

The topic of financial transfers to reindeer pastoralism in Yamal is a broad and complex topic. On one hand, herders receive may receive several different types of subsidies, at different times. While on the other hand, the implementation of the YNAO act on reindeer pastoralism difficult. The scope of this topic is beyond the focus of this thesis and will therefore not be investigated in detail.

CHAPTER 6 ORGANISATION OF *BRIGADE* NO. 8 (OF YAMAL) AND FAVRESORDDA *SIIDA* (OF WESTERN FINNMARK)

6.1 Introduction

This chapter describes the structure of two reindeer pastoralists' organisations: *brigade* no. 8 of the Yar-salinskii Enterprise on Yamal Peninsula, and Favresordda *siida* of Western Finnmark.

6.2 Organisational Structure

6.2.1 Structural composition

6.2.1.1 Brigade no. 8

Brigade 8 is made up of around 50 individuals. The employed workers are: 8 herders; one *zoo-teknik* (veterinary specialist), and; the *brigadier*, and; the wives of the aforementioned workers employed as *chum-workers*[1]. In addition the *brigade* includes 8 retired herders (receiving pension), 3 non-employed adults, around 10 children under school age and around 15 children and students who are away at school during most parts of the year. With up to 80 people during summer time, *Brigade* no. 8 is the largest *brigade* on Yamal. The constellation of *Brigade* no. 8 is stable throughout the year, and the core members (herders, wives and children under school age) stay and migrate together throughout the entire year.

6.2.1.2 Favresordda siida

The Favresordda *siida* consists of 14 operational units (*driftsenhet*). Around 70 individuals are registered under the operational units of Favresordda *siida*, making it a relatively large *siida* in Western Finnmark. Each fall, around Christmas time, the Favresordda *siida* divides itself to two separate winter *siidas*. This is due to traditional and customary pasture rights. Informant H explains: "We have always divided into different winter-*siidas*. Before we used to divide into three *siidas*, now we only divide

[1] A professional house, or 'tent' wife.

into two. We do this because both the people and reindeer belong to different winter areas. Both people and reindeer are accustomed to their areas".

6.2.2 Leadership and decision-making

6.2.2.1 Brigade no. 8

In *brigade* 8, the *brigadier* holds leadership. He is elected annually, during spring time, by the employed workers of the *brigade*, although, as mentioned in the previous chapter, a skilful *brigadier* is often elected year after year. The current *brigadier* of *Brigade* no. 8 has had the position for 29 years. His formal authority extends to decisions on which and how many state-owned reindeer to slaughter, when to migrate, when to move the herd, where to move the herd, and in general "all issues related to reindeer herding" (informant A). The *brigadier* is also the one who decides which herders are to be employed each year. Informant A points out that the decision on which and how many herders to hire is difficult and needs to be taken carefully: "The more workers, the less pay, and the more each herders has time to relax, however, the less workers the harder the job gets".

Although the *brigadier* is formally the sole decision-maker regarding issues at the *brigade* level, he consults with other members at all times. Informant B explains "Of course the *brigadier* must be aware of and consider the opinions of the other herders. A *brigadier* who does not do that will not remain *brigadier* for long. Although he has a lot of power in the *brigade*, he must remember that it is the workers who elect him".

6.2.2.2 Favresordda siida

In Favresordda *siida* the elected leader of the unit of 'reindeer herding district' (*reinbeitedistrikt*) also functions as the *siida-isit* (leader of the *siida*) for parts of the year. This is possible because as, in the case of Favresordda (but not necessarily all *siidas* in western Finnmark), there is a concurrence between the *siida* and the 'reindeer herding district' in terms of people involved and summer pastures applied.

The ‘reindeer herding district’ and the *siida* are however, two distinct units, with different functions with regards to reindeer pastoralism. A *siida* is, as previously emphasized, the organisation for polling labour, while the ‘reindeer herding district’ is a formally defined area of reindeer pastures. Favresordda *siida* is the sole *siida* on reindeer herding district 35A, which is the area of their summer pastures. Favresordda *siida* has chosen to let the leader of district 35A also function as the *siida-isit*. The choice of this strategy makes Favresordda *siida* quite unique, as in many other *siidas* the district leader does not function as the *siida isit*.

However, the district leader in Favreordda *siida* functions only as the *siida isit* as long as the *siida* is together during the summer. In the winter when the *siida* is divided into two, then the elected district leader remains the leader at the *siida* he belongs to, while the other winter *siida* functions without one single leader. This is necessary “because the two *siidas* may choose different herding strategies during the winter” (Informant H). In the winter-*siida* without a single leader, the decisions are made based on consensus among the herders. About the consensus making process and the role of the *siida isit*, Mikkel Nils Sara, a Sámi reindeer herder and a PhD candidate working on a thesis on the Sámi *siida* system, explains:

> *Strictly speaking, the siida-isit of a Sámi siida is not one who makes decisions, but one who leads the process of consensus-based decision making. People will try to bring fourth different facts and arguments, but they will not put any prestige in defending their points of view till the bitter end. Even standpoints which no one really believes in may be discussed. All parties engaged show a willingness to recognize good arguments and to emphasize these, even if they contradict one’s own standpoint at a given time. One might also somewhat reluctantly accept what seems to become the consensus decision. The alternative to the consensus-making is the more dramatic decision to leave the siida.*
>
> (Personal communication with Mikkel Nils Sara, April 2008)

The role of the *siida-isit* is thus different to that of the *brigadier,* as he is not a sole-decision-maker in the same manner as the *brigadier*. There is, however, a degree of responsibility and status endowed in the position as *siida-isit*. About the status of the *Siida isit* in Favresordda *siida*, Informant H explains:

> *in my opinion the siida isit has high status. He keeps at all times informed about what happens in the siida, how the siida functions and which paperwork needs to be done. You see, there is quite a lot of paper work in reindeer pastoralism. You need to gather reports from the different operational units, and check if they are filled in correctly.*
>
> (Informant H)

This is why, informant H tells "it is very good for the *siida* that we have a young leader. One that that knows how to do the paperwork". On the other hand, the leader also has responsibilities related to practical herding. Informant H says that "if our herd is mixed up with other herds it is the *siida isit* who has to communicate with the other *siidas* and to agree upon when and how to separate the herds". In other words, the *siida isit* of Favresordda *siida* functions as "the voice of the *siida*" (Informant H) and the one other *siidas* have to communicate with regards to issues such as common fences, mixed herds etc.

Decision making in the field is conducted by the herders on duty. Informant H explains:

> *when practical issues arise on the field the decisions on what to do next must of course be made by those on duty, but nowadays when everybody has mobile phone it is natural to call and inform others if something special happens. Communication is very important in reindeer pastoralism*
>
> (Informant H)

The practical and day-today decision-making in *siida* thus also follows a flat structure.

6.2.3 Division of Labour

6.2.3.1 Brigade no. 8

In *brigade* 8 the herding duties are divided among the employed herders, the *brigadier* and the *zoo-teknik.* It is the *brigadier* who assigns shifts to herders. One shift lasts for 24 hours for a herder with the herd. After a shift a herders has two days off. How many herders are on shift depends on the size of the herd, the season and the situation. It can sometimes be just one person, but also it can, at other times, be up to four persons.

The women play an important role in maintaining the household. Informant C explains that "while the men are with the reindeer we women take care of the *chum*. We collect firewood, make food, maintain the *chum* and make clothes". To which Informant B adds "Reindeer pastoralism is impossible without women. Without women men would starve and freeze to death. There would be no home without women". Nentsy women do not directly participate in any herding duties. Informant D explains that women do not do so "because it is forbidden according to our old beliefs". Women are, however, involved in managing and taming reindeer used for transport.

6.2.3.2 Favresordda siida

Favresordda *siida* herds according to a system of shifts, assigned equally among the 14 operational units. Herders are on shift for 4-5 days followed by one week off. During the winter there will be 4-5 herders on shift at all times, while this number may be less during the summer. Informant H appraises this system: "Nowadays we don't have to be by the herd all the time, so some people, especially young people, can have other jobs and activities beside reindeer pastoralism". However, informant H does emphasize that "even when you are not on shift, you are not completely off duty. If other *siidas* gather reindeer in the corral it is the ones off duty who have to go there to see if any of our reindeer have mixed up with their herd".

Although herders on duty are mainly men, there is nothing in Sámi traditions indicating that women could not be herders. Many older Sámi women tell stories of

how they had to start herding at a very early age. Nowadays, however, "many women have jobs beside reindeer pastoralism" (Informant H).

6.2.4 Economy

As observed by Paine (1994: 14), "Reindeer are wealth for the pastoralist". This is why discussing economy with reindeer pastoralists often involves discussions about the size of herds. This section will however focus on the incomes of the *brigade* and the *siida*, be it monetary income or goods traded through bartering, and not on values stored in live reindeer.

6.2.4.1 Brigade no. 8

The households of *Brigade* 8 are independent entities with private economies. They are responsible for maintaining their chum and work equipment. This includes clothing, sledges, lassoes, poles, and all other equipment. The *brigade* does, however, supply households with transport reindeer if needed. In other words, if the economy (number of reindeer owned) of the household does not allow them to tame sufficient number of transport reindeer.

The members of *brigade* 8 have two main sources of income: salary from the *sovkhoz* and payment for private reindeer slaughtered:

Private reindeer may be sold to the Municipal slaughterhouse, '*Yamal'skie Oleni'* (Yamal Reindeer). The price per kilo was in 2007 RUB 80 (≈ € 2.2), amounting to around 5000 RUB (≈ € 136) for a large reindeer, and RUB 2500 (≈ € 68) for a small reindeer. Both Informant A and B regard this as a "good and fair price" for reindeer meat. The number of private reindeer slaughtered varies from household to household.

Employed herders receive a salary of RUB 6000 (≈ € 165) per month. When a herder is employed, his wife is also often employed as *chum worker*. She receives a salary of RUB 3000 (≈ € 82) per month.

Households may get additional income from subsidiary activities, such as selling handcrafts (especially clothes), selling fur (hunting wolves and other predators, as well as hunting game). For example, there is a reward for killing wolves and wolverines amounting to around 4000 RUB (≈ € 108) per animal, while the fur may be sold for around 7000 RUB (≈ € 190). Reindeer herders will, however, often receive a live reindeer in payment instead of money.

There is also a barter economy existent in reindeer pastoralism in Yamal. For example, One *Narta* (Nentsy sledge used to drive reindeer) can be exchanged for reindeer. Informant (E) explains:

> *When I first started as a reindeer herder I used to make 'narta' and exchange them for reindeer. After my herd grew I no longer had the time to make so many 'narta'. Then I became the one to exchange reindeer for narta.*
>
> (Informant E)

In addition exchanging reindeer meat for fish with local fishermen in the villages is also common. This relationship is described in Sámi as *Verddevuohta*, defined by Pain (1994: 6) as "partner in a relationship of reciprocal services and goods between a nomad and sedentary", and is also present among other reindeer pastoralists. In Yamal, however, the presence of a barter economy is stronger than in Western Finnmark, and often essential for life on the tundra.

The *brigade* relies on meat sale and government subsidies for income: Subsidies are paid for *brigade* reindeer slaughtered. This is paid back to the *brigade* in terms of salary to workers. In addition the *brigade* receives the following from the *sovkhoz*: Vaccination for dogs, and mosquito repellent and as vaccination for reindeer.

6.2.4.2 Favresordda siida

Also the households of Favresordda *siida* are private entities in the sense that they are responsible for maintaining their own home and work equipment. This includes clothing, snow mobiles, sledges, lavvos, lassos, binoculars, dogs etc.

The households of Favresordda *siida* have two main sources of income: Revenue from slaughter and government subsidies.

Meat sold to official slaughterhouses is paid according to classification (weight classes). The weight classes are 18, 16 and 14kg. The price per kg in the highest class was, in 2007, NOK 60 (≈ € 7.6). Informant H considers this "a good price" and tells that he changes the same price if he sells reindeer privately.

There are five main types of governmental subsidies paid to the operational units[1]. A subsidy for running costs (*driftstilskudd)*, amounting to NOK 10 000 (≈ € 1266) is paid to all operational units. A production-subsidy (*produkjsonspremie)* is paid amounting to 25% of income received from meat sold to approved slaughterhouses, and other excisable income. A subsidy of NOK 180 (≈ € 22.8) is paid for every calf slaughtered and reported in the period of 15. August- 31- December (*Kalveslaktetilskudd)*. A early-slaughtering subsidy (*tidligslaktetilskudd)* of NOK 10 (≈ € 1.3) is paid for every kilo of meat for reindeer slaughtered in the summer pastures, or NOK 5 (≈ € 0.6) per kilo slaughtered in the period between 10. October - 31. December. Finally, a so-called spouse-subsidy (*ektefelletilskudd)* of NOK 35 000 (≈ € 4430) is paid if both parties to a marriage are involved in reindeer husbandry, and neither have a registered salary from other incomes amounting to more than NOK 175 000 (≈ € 22 150). In addition, there are several other minor types of subsidies available for application.

There are also several types of compensations reindeer herders may apply for. These include compensation for reindeer killed by predators[2], for substantial number of

[1] All figures from the Norwegian regulations for subsidies to operational units, FOR 2003-07-03 nr 922: *Forskrift om tilskudd til driftsenheter og tamreinlag.*
[2] Informant H explains, however, that compensation hardly equals actual loss, as documentation of loss of often difficult.

reindeer lost in accidents[1], for reindeer meat spoiled due to radioactivity[2], and for leaving the industry all together and de-registering the operational unit.

The reindeer herding district may also apply for government support, in terms of grants for administration, for preparing and managing pasture resources and deposits to a crisis-fund (the district will receive an equal amount of grants as the deposits it makes in the crisis fund). As the reindeer herding district and the *siida* coincide in the case of Favresordda *siida*, this means that the *siida* has funds available for communal uses. For example, during spring time, gasoline costs of herders on shift are paid from the district's funds. Additional forage for reindeer, such as hay or artificial feed, is also paid through the district's funds.

6.3 Herding and migration practices of Brigade no. 8 and Favresordda siida

6.3.1 Herding practices

6.3.1.1 Brigade no. 8

As mentioned above, herding in *brigade* no. 8 occurs in shifts. They herd reindeer constantly throughout the year. The members of *Brigade* no. 8 use only reindeer for transport to and from the herd (some members of the *brigade* do own snow mobiles, but these are used mainly for transportation of goods to and from villages during the winter and early spring). The Nentsy use teams of 2-6 reindeer in pulling a *narta,* both during the summer and the winter time.

6.3.1.2 Favresordda siida

Herding in Favresordda *siida* also occurs in shifts, but the shifts are longer than those of *Brigade* no. 8. During shifts, herders stay in herding-cabins located on the winter pastures. Favresordda *siida* herds their reindeer during the summer as well, but not as intensively as during the winter months. All families have permanent houses in Guovdageaidnu where they live during the winter time, and most also have permanent

[1] 10% of the herd or more than 150 animals.
[2] Radioactivity remains from the Chernobyl accident in 1986

summer-houses in the summer pastures where families live during the summer months. Thus a herder will return home to the village when his shift is over. The Sámi reindeer pastoralism can therefore be defined as only semi-nomadic compared to the fully-nomadic pastoralism of the Nentsy.

The Sámi use mainly mechanical means of transport, such as snowmobiles during the winter and four-wheel bikes and motor cycles during the summer. Some *siidas* even use helicopters to assist gathering the reindeer. This is, however, not a practice used by the Favresordda *siida*.

6.3.2 Pastures

6.3.2.1 Brigade no. 8

Brigade 8's winter pastures are located in on mainland areas of Nadymski Region (see fig. 6.1). The pastures are characterised by forests of Siberian Larch trees. The pastures are lichen covered, while the forest encourages lose snow conditions. Encroachment is experienced here due to building of a new railway and a road from Salekhard to Nadym, crossing through the *brigade*'s winter pastures.

Summer pastures on Yamal are flat wet areas, and can generally be characterised as very lush areas in the context of reindeer pastoralism. The Bovanenkovskoye field is located in the summer pastures of *Brigade* 8. The development of the field is the single largest encroachment experienced by *Brigade* 8.

The spring and autumn transit pastures on the central Yamal peninsula are used by all the *brigade*s of the Yar-Salinskii enterprise. This thin strip of pastures thus represents a bottle neck for *Brigade* no. 8, and where pasture degradation is most likely to occur.

6.3.2.2 Favresordda siida

The Favresordda *siida* has their winter pastures in the southwest of Guovdageaidnu municipality, while their summer pastures are located in Kvænangen in Troms.

Favresordda *siida*'s winter pastures are is a mixture of birch forest and tundra. Is generally more exposed to conditions of hard-pack snow than Yamal.

Favresordda *siida*'s summer pastures are characterised by mountains and *rášša* [tract in high mountains which is covered with small stones without any vegetation]. The summer pastures of Favresordda *siida* are generally less lush than Yamal.

Favresordda *siida*'s pastures are exposed to bit-by-bit encroachment experienced in the Barents region in general. As recognised by UNEP, the traditional grazing areas of Finnmark have been subjected to increasing encroachment hydropower development, cabin resorts, forestry and mineral exploration (Nellemann et. al. 2001).

Favresordda *siida* belongs to the common reindeer herding district, numbered 30A in the winter, spring and autumn time[1]. Favresordda *siida*'s summer pasture is assigned district number 35A. The access to the different seasonal pastures is regulated according to resolution by the reindeer husbandry board.

The allocated time period for the summer pastures in district 35A is from 01. March – 31. December. The allocated time period for autumn pastures is 01. October- 31. December, spring pastures 01. March- 15. May, and winter pastures 01. November- 05. May (Reindriftsforvaltningen, 2006: 114-115).

6.3.3 Migration routes

6.3.3.1 Brigade no. 8

Brigade 8 starts their spring migration around mid-march, crossing the Ob, and migrating on a straight line past Yar-sale and Portsy-Yakha, before reaching the coast (see fig. 6.1). They stay on their northernmost pastures for only a period of about 10 days before returning and following the same migration route towards the winter pastures again. Their total annual migration route is 1600 km (800 km one way). The

[1] Winter, spring and autumn pastures in Guovdageaidnu municipality are divided into 3 common districts, called the eastern, central and western district. Favresordda *siida* belongs to the Western district.

migrational pattern of *Brigade* 8 implies that the *Brigade* is more or less on constant move throughout the year. The longest period their camp is stationary is around 2-3 weeks in their winter pastures.

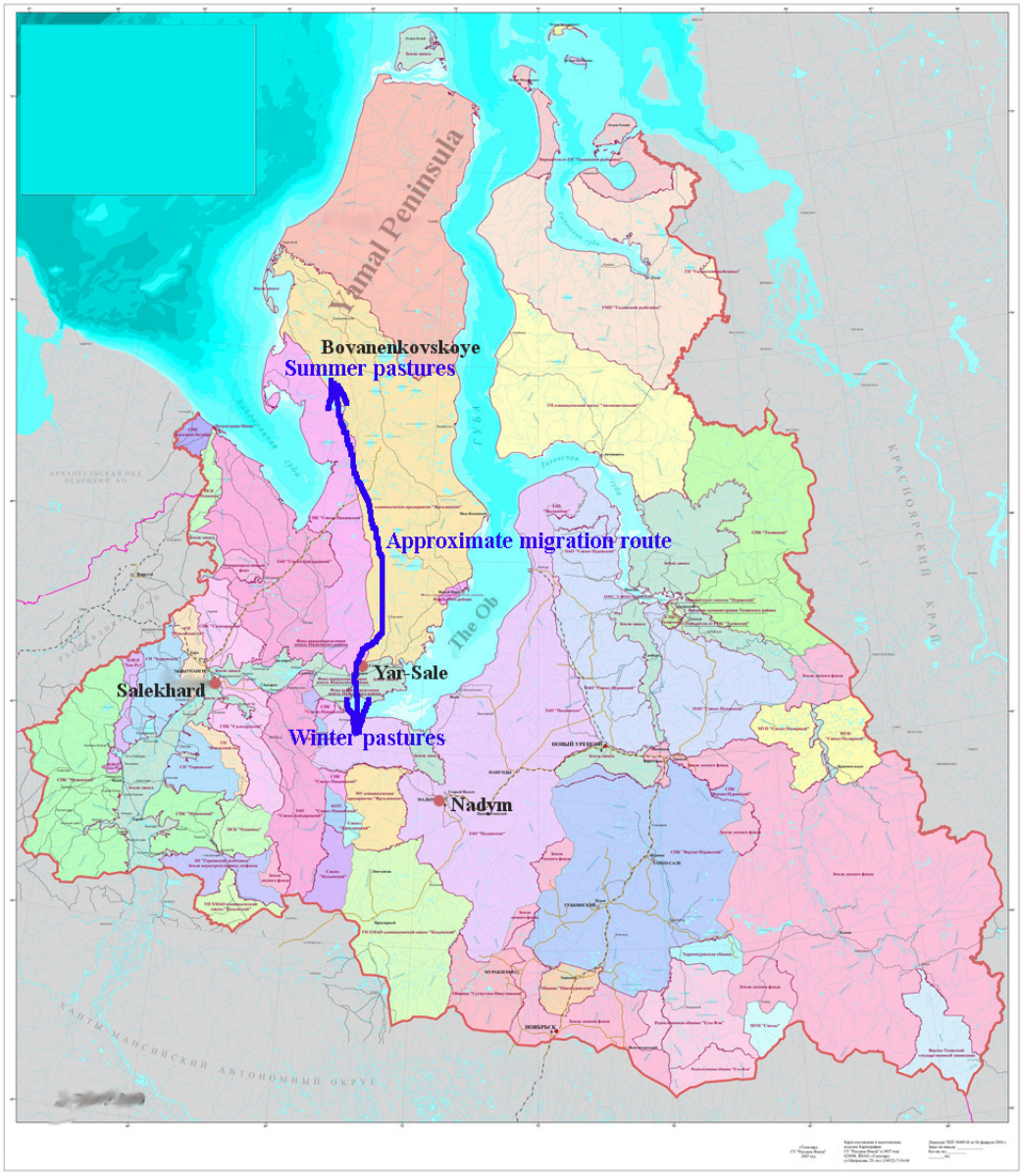

Fig. 6.1 Map showing pastures and Migration route of Brigade no. 8 (Source: modified map from the administration of the Yamal Nenets Autonomous Okrug)

6.3.3.2 Favresordda siida

The Favresordda *siida* conducts two major migrations in the year, the spring and the fall migration. Their migration route is approximately 200 km one way. Their migration only takes a few weeks each way.

Generally the herders will migrate with the reindeer, while the rest of the family will travel by car towards the coast bringing all equipment which is not needed during the migration itself. Wives and children might, however, join the migration when this is practically possible (especially during spring time when school vacations may coincide with migration times).

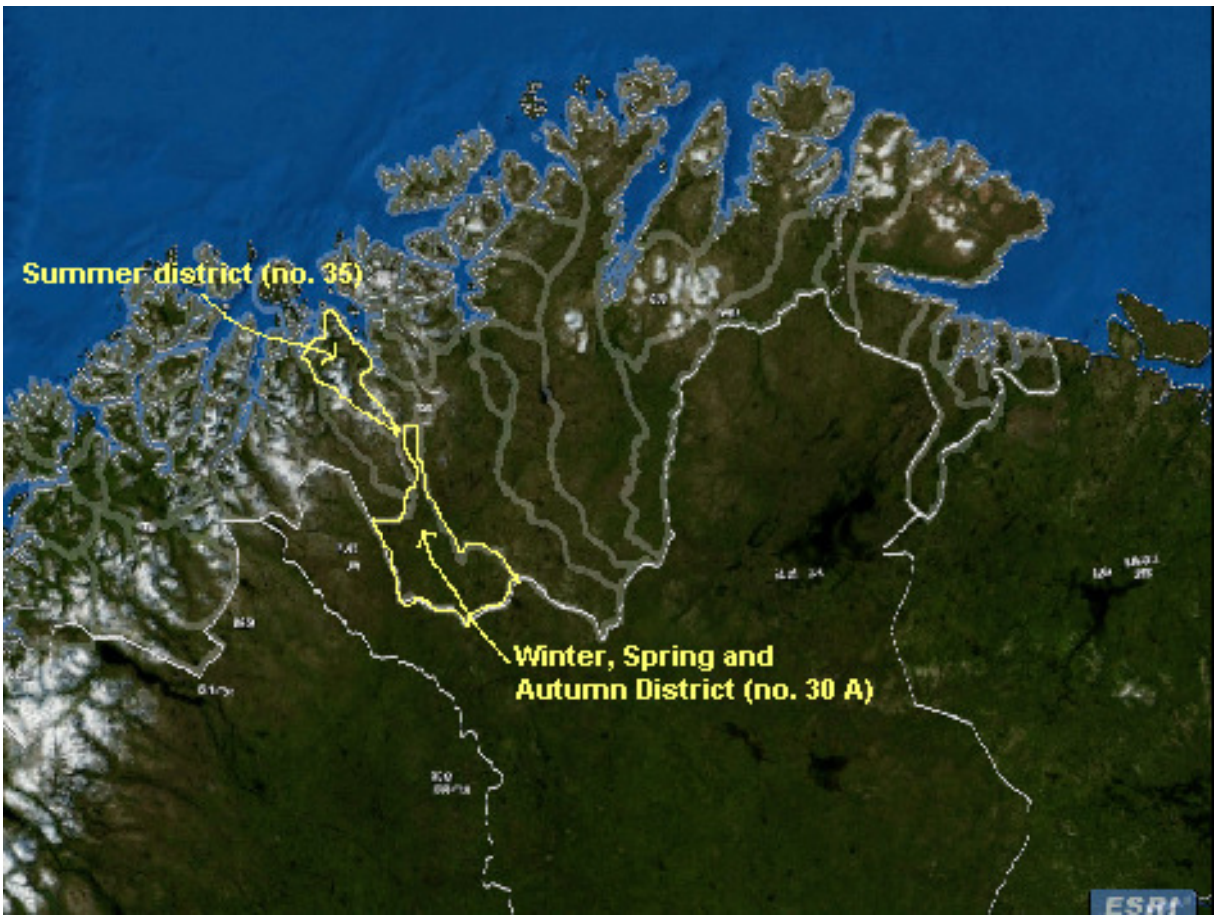

Fig. 6.2 Map showing the Pastures of Favresordda siida (Source: Modified map from the reindeer Husbandry Administration of Norway)

6.3.4 Herd structure

6.3.4.1 Brigade no. 8

About the herd structure in *Brigade* 8, informant B comments that "In Russia, in general, this *Brigade* is seen as one of the best *Brigade*s. That is because our reindeer are in good condition, our calves are in good condition and the production is high". Further, Informant B explains in more detail: "We try to keep 60-65% female reindeer in the herd, and approximately 1 non castrated male reindeer per 15 cows. The rest of the males are castrated". Informant A adds that they try to maintain approximately 120

castrated older (5-6 year old) males in the herd: "Older male reindeer function as bulldozers. They are strong and can dig trough hard snow layers making the forage available for also weaker reindeer. 120 older males in the herd is an appropriate number for our herd".

The number of *sovkhoz* reindeer in the *brigade* is around 2000. Informant A explains: "We try to keep this number stable. We neither want more or less *sovkhoz* reindeer in the herd. If there are more, we will have to sell and slaughter more calves, if we have less then there will be less money in the *Brigade*". Including private reindeer the total herd size of *brigade* 8 is around 4000-7000 reindeer[1].

6.3.4.2 Favresordda siida

The composition of Favreordds *siidas* herd is annually reported to The Reindeer Husbandry Administration through the 'report on reindeer husbandry' (*reindrifts melding)* filled by the administrators of operation units.

On the 31st of March 2007, the registered number of reindeer in Favresordda *siida* was 7039, and the herd structure was 6% males, 80% females (cows) and 14% calves[2].

On questions about herd structure, informant H tells that this is an issue they have discussed intensively in Favresordda *siida*. He explains:

> *There was a time when we had a very large herd, and the reindeer were small and generally in a bad condition. The calves weighted too little, the males weighted to little, and the females weighted too little. And then we started thinking: this is not working! We have to decrease out herd; there is no way around it. ... So we discussed it in the annual meetings and in the*

[1] The exact number of reindeer is often difficult to obtain, without official counting, in reindeer pastoralism. A modest *brigade* member will say that the total number of reindeer is 4000, while they neighbors might say a much higher number, up to 7000.
[2] Number from Reindriftsforvalningen (2008), *Resursregnskap for reindriftsnæringen for reindriftsåret 1. april 2006- 31. mars 2007,* Alta: Reindriftsforvaltningen, pp 104-105

board, and decided to try selling calves. We had heard that calf-selling is effective

(Informant H)

Further he explains:

We have been selling calves for around 10 years now: the number of reindeer has decreased and the weight of reindeer has increased. I certainly do not regret that decision. It is a good result when the reindeer are in good condition

(Informant H)

About the implications of the result he explains: "In our *siida* the number of reindeer has decreased by almost half since the 1990s. We have more space in our winter pastures now, and the reindeer are in better condition" (Informant H). As mentioned in the earlier section of this chapter, there is a substantial subsidy for slaughtering calves in Norway. The *siida* certainly also has economic incentives for slaughtering calves.

Selling calves has naturally its implications for the herd structure. Informant H explains: "When selling calves, the herd structure automatically becomes such that you have very many females in the herd. But I think it is very important that you also have enough males in the herd." This, he explains, functions in two ways: First "If your *sarva* [non-castrated males] are too few and too small, the calves will not be good. You need strong and good *sarva* to get good calves. This is something that the reindeer herder will have to plan for already when deciding which calves to sell. He needs to know his reindeer and see which calves would become good *sarva*"; secondly, "older castrated males can smash through hard snow layers. Since they don't have any antlers, even a small female can push him away, forcing him to dig a new hole. But that is not a problem for the *nulpo* [reindeer without antler], he will dig a new hole"; and finally "males keep the herd more *lodji* [manageable], the herd will keep closer together and not spread as easily".

Informant H says “I have always believed that you need many males in the herd, at least 20-30%, the higher the percentage the better. But nowadays, when people sell calves I don’t think such a high number is realistic. Even 20% is unrealistic now”.

6.3.5 Responses to challenging pasture conditions

6.3.5.1 Brigade no. 8

The members of *Brigade* 8 mention several years when they experienced challenging pasture conditions. On question about bad winters and how to respond to them, Informant A tells about the winter of 2003:

> *Winter, 4 years ago rain caused icing of the pastures, a period of black ice, in the Nadym area [in the winter pastures]. The ice was so hard that reindeer could not dig through it. That year we decided to not migrate over the Ob at all. Instead we stayed here on the tundra [in Yamal Penisula] all winter. There was nothing else we could do.*
>
> (Informant A)

Further Informant A tells “In order to prevent a crisis for humans, we have to do everything in our power to protect reindeer and make sure there is enough feed available for them”. To question on what resources are available for reindeer herders to manage through hard winters, Informant A responds: “Pastures are our greatest resource during times of crisis. We must therefore try our best to prevent losing pastures”.

Informant B tells about the winter of 2006-2007: “This winter there came rain in October … We were thinking and discussing whether we should stay on the tundra this year, but when we went to check the pastures further south, we discovered that the winter pastures in Nadym area were not frozen, so we decided to migrate over the Ob after all”.

Informant G belongs to a different *Brigade* of the Yar-salinskii enterprise. His *brigade* is one of the last *brigade*s to migrate southwards during autumn. About the winter of 2006-2007 he tells:

> *When we came south, close to Yar-Sale, many herds had already migrated, leaving the entire area covered with hard snow, [snow trampled by reindeer often leaves a hard snow cover]. In addition it rained on the 8-9. January, leaving a 2 cm ice cover on top of the snow. We had no other choice but to turn back northwards where the snow conditions were better. Our brigade has therefore stayed on the tundra all winter.*
>
> (Informant G)

6.3.5.2 Favresordda siida

For Favresordda *siida* the winter of 2006-2007 also presented some challenging pasture conditions. Informant H tells that "The winter itself was not bad, but neither was it good. But the spring was very bad. You see, there was a lot of snow last winter, and the spring was very long. Luckily there was no *geardnji* [ice layer under the snow cover], but there was one period during spring when the pasture conditions were indeed challenging". On my question on how reindeer herders can respond to such pasture conditions, Informant H replies "There is not really much you can do about it. The only thing is to feed the reindeer with additional forage". Further he tells "last year our *siida* spent NOK 40-50 000 on buying reindeer feed. To buy reindeer feed is the only thing that we can do when pasture conditions are bad". To question on what resources are available for reindeer herders to manage through hard winters, Informant H responds: "There is an arrangement that the *siida* can establish a so-called crisis-fund at the reindeer husbandry administration. If we deposit one amount to that fund the state will deposit the same amount. So the state pays half of the fund. I think that is a very good arrangement. Then we can save during good years, and have additional money during bad years. It is almost like a type of insurance".

CHAPTER 7 RESILIENCE EMBEDDED IN THE SOCIAL ORGANISATION OF REINDEER PASTORALISM

7.1 Introduction

Chapter 4 identified the key factors of resilience as according to which the social organisation of reindeer pastoralism will be investigated as: Learning to live with change and uncertainty, Nurturing diversity for reorganisation and renewal and combining different types of knowledge for learning. Berkes and Jolly (2001) identify 5 adaptive responses characteristic to indigenous-peoples of the Arctic, and considered as central to the long-term success of these peoples: "(1) mobility and flexibility in terms of group size; (2) flexibility with regards to seasonal cycles of harvest and resource use, backed up by oral traditions to provide group memory; (3) detailed local environmental knowledge and related skill sets; (4) sharing mechanisms and social networks to provide mutual support and minimal risk; and (5) intercommunity trade". The following chapter will show that these adaptive responses are applied to a greater or lesser degree by reindeer pastoralists of both Yamal and Western Finnmark, and that these responses are embedded in the social organisation of the Yamal and Western Finnmark pastoralists.

7.2 The role of the siida and the brigade in learning to live with change and uncertainty

Accepting change and uncertainty is a key notion of resilience. As argued by Walker and Salt (2006: 9-10): "At the heart of resilience thinking is a very simple notion – things change – and to ignore or resist this change is to increase our vulnerability and forego emerging opportunities. In so doing, we limit our options". In order for the social organisation of reindeer pastoralism to foster resilience it needs to contain characteristics that enable the system to accept change and uncertainty.

7.2.1 Evoking ecological disturbance

Folke et. al. (2002) recognise that evoking disturbance in social and ecological spheres is a strategy used by many indigenous communities as a strategy to speed up local

renewal processes and to avoid the accumulation of disturbance. Such strategies are, however, not commonly applied by neither reindeer pastoralist of Yamal nor reindeer pastoralists of Western Finnmark.

It may be argued direct and intentional disturbance on pastures contradicts the nomadic strategy of reindeer pastoralism. The migrational pattern of reindeer pastoralists ensures that pastures are exploited in a rotational manner. The summer pastures of both Favresordda *siida* and 8th *Brigade*, are generally left undisturbed during the winter period. The strategy of moving the entire herd (and not leaving any reindeer behind) from one seasonal pasture to another implies that pastures are left completely undisturbed and able to renew themselves. The intensive use of pastures during a short period of time, and then leaving them undisturbed for the rest of the year, is the equivalent strategy used by reindeer pastoralists to avoid ecological disasters in terms of pastures.

It should be noted, however, that special circumstances might lead to exceptions of this rule. In a study of Evenki reindeer herders in Chita Oblast of far-eastern Siberia, Anderson (2006: 91) observes that Evenki herders have "adopted a regional form of controlled burning of mashes in early spring in order to quickly produce thick green grass for the reindeer at a time when forage is low" as a response to large areas of forage lost due to forest fires and industrial disturbance.

7.2.1.2 Evoking social disturbance

Evoking disturbance in social structures as a strategy for accelerating organisational development and renewal is another strategy facilitating resilience in social-ecological systems (Folke et al, 2002). Management actively behaving like disturbance is one of the strategies for evoking disturbance.

Reindeer pastoralists' social organisations do not have direct strategies for evoking social disturbance, in the manner described by Folke et al. (2002). Social organisational constellations do change in terms of *siida* or *brigade* members moving,

population changes, or due to marriage. Changes in the organisational constellation also occur in the Sámi *siidas* through, splitting up in several *siida* during the winter while merging again to a larger *siida* during the summer, as is the practice of Favresordda *siida*, and also in most of the private *parmas* on Yamal. However, this cannot be considered as an intentional strategy to evoke disturbance in order to ensure resilience of the pastoralism.

7.2.2 Learning from Crisis

Learning from crisis represents an important aspect of resilience in social-ecological systems. A crisis is defined as large perturbation, human induces (such as resource collapse) or nature induced (such as the effect of adverse weather conditions) (Folke et. al. 2002). Folke and Berkes (2002: 142) identify three generic responses to resource and environmental crisis: ignoring the crisis; reacting with no memory or experience, and; responding with experience. In order to be able to respond with experience, institutional learning caused by previous crisis in social ecological memory must have taken place.

The question arises whether there are crisis in reindeer pastoralism. None of the informants tell of crisis, instead they always refer to challenging past events as "bad years", "bad *ealát* [pasture conditions]", never as a crisis. For the purposes of this study, large perturbations in terms of challenging pasture conditions are defined as crisis as described by Folke et. al. (2002). Such perturbations have occurred for both the 8th *brigade* and for Favresordda *siida*:

Winter off 2002/03 the *Brigade* no.8 was faced with an environmental perturbation in terms of locked pastures. The winter pastures on Nadym area were locked due to an ice cover caused by rain. The *brigade* responded to this by staying on the tundra of Yamal peninsula throughout the winter. The response to the perturbation was movement. When rain in late fall of winter 2006/07 again caused pastures to freeze again, the *brigade* contemplated using the same strategy, but discovered through

investigation of pastures that the winter pastures in Nadym area were good. The *brigade* therefore continued their migration over the ice layer on to the winter pastures.

The ability to recognize a large perpetuation, in this case caused by rain, and the contemplation on whether to return towards summer pastures, shows a response based on experience. The *brigade* shows an ability to learn from previous perturbations and also responding to perturbation with experience. The above mentioned example illustrates that the capacity of the *Brigade* to respond to crisis. Their response in both the 02/03 case and the 06/07 shows that the *brigade* had developed institutional memory in relation to previously experienced crisis, and was able to respond with experience as a result of this development. Their response is based on using different pastures as an emergency resource. This strategy is also evident by Informant A's statement: "Pastures are our greatest resource in case of crisis".

The strategy of movement as a response to challenging pasture conditions is a strategy used by not only *Brigade* no. 8 on Yamal. Informant G, the *brigadier* of the *Brigade* no. 2 explanations of their response, or not migrating over the Ob, to locked pastures in Yar-Sale area in 2007, indicates that mobility is a common response to such pasture conditions.

Unfavourable snow conditions causing unavailable foraging for reindeer is also experienced in Western Finnmark by Favresordda *siida*. However, they have a smaller area of pastures available for manoeuvring in during the winter. Using seasonal pastures off-season is not an option easily available due to regulations and customary rights. Instead, the Favresordda *siida* responds to locked pastures by providing emergency feed for reindeer, in terms of either hay or special reindeer feed. There is also a practice of harvesting lichen during autumn in order to have a small reserve of reindeer forage available. In addition, the *siida* has also established a crisis-fund at the reindeer husbandry administration. This arrangement allows the *siida* to deposit money at the fund during good years, and withdraw funds in years when additional feeding is required.

Also this strategy is based on previous experience. Favresordda *siida* has, like *brigade* 8, experienced numerous hard winters whereby forage for reindeer is unavailable, lock either under hard-packs of snow or under layers of ice. Both the responses of *brigade* no. 8 and Favresordda *siida* indicate and ability to learn from crisis.

7.2.3 Expecting the unexpected

Resilience in social-ecological systems is enhanced by adopting a strategy of not trying to diminish disturbance, but instead accepting that uncertainty and surprise are a part of development. Management strategies of resilient social-ecological systems cope with the effects of uncertainty and change by spreading risk though diversification of resource use patterns and alternative activities (Folke et. al. 2002)

Strategies for spreading risk are identifiable in the actions of the *Brigade* no. 8 and Favresordda *siida*.

7.2.3.1 on-field decision making

The horizontal structure of power in the *siida* contributes to the *siidas* possibility for effective short-term response to unexpected events. Informant H's account of responsibility on field, shows that the herders on duty are responsible for reacting to unexpected events. Nowadays communication is easy though the use of cell-phones and it normal for the herder to call and inform others in case something happens, for example if the herd gets mixed up with other herds, pasture condition deteriorate or a predator is found to have killed reindeer. It is still, however, the herders on shift who decide on the response strategy. This allows for decisions to be made on the field, by the person with the best knowledge of the situation in hand (Sara 2001). This is particularly relevant for the Sámi reindeer pastoralism as herder off-duty are not based in a camp near the herd. Rather they are based in the village, some occupied with other activities. This strategy is also described by Paine (1994:15), noting that an "imperative of the work organization is that whoever is on the scene must *act* on behalf of the group. It is, then, a work organization in which authority is distributed

pragmatically and much dependence is placed on the exercise of discretion. There is probably no better way of coping with the difficulties that face reindeer herders".

Brigade no. 8 has a more hierarchical structure. The *Brigadier* is responsible for making all the decisions related to reindeer husbandry within the *brigade*. Informant A explains " if a herders on shift experiences unexpected events he should return to the camp to fetch the *brigadier*". However, this is not an absolute rule. If there is a need for immediate response the herder should, of course, first attend to the problem, then fetch the *brigadier*. The practice of fetching the *brigadier* might correspond to the practice of Favresordda *siida* whereby communication through the use of cell phones is expected. This is supported by Stammler's (2005:51) observation; "In the Russian context, the only area where there is real equality is in the herders work-shifts (*dezhurstvo),* where each herder during his shift has equal responsibility for the herd, whether or not he is the owner, *brigadier, zoo-tekhnik* or guest", suggesting that there is a mechanism for on-field decision making in the *brigade* as well.

7.2.3.2 Spreading risk through movement

For *brigade* 8, movement represents an important aspect of spreading risk. *Brigade* 8 moves from the forest areas on the cost of Ob to the tundra pastures in the north-west of Yamal peninsula. Although they follow the same route year-by-year, movement allows for flexibility of pasture use in case of unfortunate pasture conditions. During the spring migration the *brigade* moves every 2 or 3 days. One day the *chums*, equipment and people are moved. The second day the herders return back to move the main herd of reindeer. In beforehand the *brigadier* has investigated pastures and found an appropriate area to move the herd to, basing his choice on consideration of pasture quality.

Although the main route of migration is relatively stable, and happens between the borders of the *Brigade*'s assigned strip of pasture, there is room for flexibility within these borders. Thus by moving constantly, the *brigade* is able to swiftly leave areas when pasture conditions are unfavourable.

The Favresordda *siida* moves from inland pastures in Guovdageaidnu during the winter to coastal areas in Troms. In spring, herders first migrate with reindeer over to the summer pastures. Then, families and equipment are moved by car to their summer area, where most families have small-summer houses. Their migration does not consist of constant migration throughout the year on a long strip of pastures as *brigade* 8. Instead, Favresordda *siida* conducts migration only twice a year, during the spring and during the autumn. Within their assigned summer and winter pastures, the *siida* is free to move their reindeer according to pasture conditions. However, their movement is restricted to the seasonal pastures, and within their customary pastures. And they are not normally able to use for example summer pastures during the winter. The continuous movement of the herd is an option. When pasture condition deteriorate, the herd will be moved to the best available location, either in term of the best location for available forage or the best location for remaining the herd manageable, and where additional forage may be provided. The additional forage provides the additional opportunity to spread risk.

7.2.3.3 Alternating activities

The pooling of labour in the *siida* and the *brigade* is one measure of spreading risk in reindeer pastoralism through allowing members to participate in alternating activities. This provides additional security for ensuring resources.

In Favresordda *siida* some members make souvenirs out of reindeer products throughout the year, and sell these, mainly in the summer. The income of such sales represents an additional income for the families. In some families members are occupied in other full-time or part-time jobs, providing additional economic security for the household. Picking berries in the summer, fishing and other subsistence activities also contribute to this.

In *brigade* no. 8 women also sew clothing and other items for sale. This is, however, not preformed in such a large scale as in Favresordda *siida*.

The *brigade* 8 relies on alternating activities through fishing in the summer. During the summer the *brigade* relies almost solely of fish as a food source. Barter economy, in terms of providing exchanging reindeer meat with fish also represents an activity ensuring resilience.

The polling of different skills represents a method of spreading risk in the *brigade* and the *siida*. The pooling of labour also enables an effective use of labour such that members are free to participate in alternating activities. Thus increasing resilience in terms of increasing economic ability.

7.2.3.4 The importance of herd structure to increase resilience

As noted in Chapter 6, Informants from both Yamal and Guovdageaindu emphasize the importance of herd structure. Both the *brigade* and the *siida* pay close attention to the herd structure and use it as a means for manipulation and resilience building. For example, the castrated male bulls represent a strategy of spreading risk and ensuring the herd's adaptive capacity to hard snow layers.

At IPY EALAT workshop in February 2007 in Guovdageaidnu, Johan Mathis Turi, general secretary of Association of World Reindeer Herders, explained in his presentation on "understanding the behaviour of reindeer and the herd's adaptation to climate":

> *In theory, it is possible to create any herd structure one wishes in order to adapt to the specific pastures one operates in. It is however possible to question who decides what in this pact of co-operation between human beings and reindeer. The truth is closer that both are aspects of in the game of nature. Because it is the nature of the pastures which provide the limitations on which type of reindeer pastoralism it is possible to establish in that specific area, and thus also the framework the human being may manipulate and operate within. It is given that in an area lacking the type*

of pastures preferred by bulls it is difficult to maintain a herd with many bulls. In the same way it will be difficult to exploit the pastures effectively with a herd of females if the pastures preferred by females are the minimum factor. The general picture is that the reindeer pastures are composed of different pastures which cannot be exploited optimally without differentiated gender and age structures in the herd.

(Turi 2007)

A heterogeneous herd structure is a method to exploit pasture areas effectively, while at the same time providing some insurance for challenging pasture conditions. The development of herd structure is used as a means to increase resilience in reindeer pastoralism. The difference between the herd structures of *brigade* no. 8 and Favresordda *siida* does show, however, that the *brigade* has a more heterogeneous herd. The characteristic of reindeer is such that females are by nature more nervous and males are by nature less nervous. This also suggests that the Favresordda *siidas* herd might be less manageable, due to its large percentage of females. The degree of resilience resulting from a heterogeneous herd structure might thus be greater in *Brigade* no. 8 than in Favresordda *siida*.

7.3 The Siida and the Brigade as an arena for nurturing diversity for reorganisation and renewal

In addition to the insurance aspects dealt with in the previous section, diversity also plays an important role in reorganization and renewal process following disturbance. It is in this context that the memory – ecological and social – becomes significant because it provides a framework of accumulated experience for coping with change (Folke et. al. 2002: 363-363).

7.3.1 The *siida* and the *brigade* as arenas for nurturing Ecological Memory

7.3.1.1 Preserving pastures through movement

Ecological memory may be defined as "the composition and distribution of organisms and their interactions in space and time, and include the life experience with environmental fluctuations" (Folke et. al. 2002)

Informant D explains that the strategy of migration in *Brigade* 8 is also based on consideration of pastures "If we don't move all the pasture will be grazed down in that area". Thus, in order to avoid pasture degradation of one area, the *brigade* moves frequently from one place to another. Paine (1994:14) recognizes that the seasonal movement as a consideration of both the animals' needs and the need to preserve pastures:

> *The seasonal movement of herds between pastures is influenced both by the animals' biology and physiology and by ecological factors that the pastoralists take into account. For example, the annual spring migration off the tundra towards the coast responds to, among other things, the animals' need for protein (grasses) and the pastoralists' wish to save the lichen beds on the tundra for the winter.*
>
> (Paine 1994:14)

In a study of Yamal reindeer pastoralism, Stammler (2005) established that the pastoralists usually do not set up camp on lichen covered areas in order to preserve lichen for reindeer. This strategy was unfortunately not discussed during my field-work. However, the practice represents one strategy for nurturing ecological memory.

Favresordda *siida* has adopted a strategy of selling calves in order to decrease the population of reindeer in their herd. This strategy was based on a consideration that

their heard was too large for their pastures, that their allocated pastures could not effectively sustain the size of their herd.

7.3.2 The *siida* and the *brigade* as arena for sustaining social memory and for enhancing social-ecological memory

Folke et al. (2002:367) argue: "Social memory is the arena in which captures experience with change and successful adaptations, embedded in a deeper level of values, is actualized through community debate and decision-making processes into appropriate strategies for dealing with ongoing change". Folke et al. (ibid:369) specify that "The experience, of the role of disturbance, uncertainty and surprise, and the need to nurture biodiversity and conserve ecological memory for maintaining adaptive capacity, must be stored in the social memory of resource users and managers and be expressed in management practices that build resilience". The *siida* and the *brigade* have several functions for sustaining social memory and enhancing social-ecological memory.

7.3.2.1 The siida and brigade as areas for transferring knowledge to younger generations

Nergård (2007: 63) argues that the *siida* is a key arena for socialisation and knowledge transfer for youth and children. The children of the *siida* overhear and even participate in discussions about pastures, weather, reindeer and other topics related to reindeer pastoralism. The children and youth of the *siida* also frequently participate in activities related to reindeer herding, be it either during earmarking, slaughter, building fences or assisting a father or an uncle with herding duties when possible.

This is also true for the youth and children of the *brigade*. The children of *brigade* 8 live with their parents and are full-time reindeer pastoralist until they reach school age. During these years their life is embedded with reindeer pastoralism, from the stories they are told to the games they play. Informant A's grand-son, aged four, is already a skilled lasso-thrower and he continued to improve his skills by practicing every single day during my stay with the *Brigade*.

During school-years children of the *Brigade* live in boarding schools in the village. When asked whether children lose their traditional knowledge during the years of schooling, Informant A replied that he does not consider children's absence during school years a problem for two reasons: first, children are able to visit the *brigade* several times during the year, and therefore do not lose their affiliation with the *brigade*; secondly, the knowledge children acquire through schooling equips them to meet future challenges.

Through the process of socialisation, and by providing an arena for children to learn by participant observation, or learning by herding, the *siida* and the *brigade* function as means through which knowledge is transferred to younger generations.

7.3.2.2 The siida and the brigade as an arena for sharing experience

The *siida* and the *brigade* also function as an arena for herders to share and discuss experience. As argued in the previous chapter, the consensus-based decision making processes of the *siida* encourage discussions among members. Also the *brigade* functions as an arena for sharing experience, as herders will daily discuss the developments on the field.

Sara describes these functions in the following manner:

> *The siida is the only arena [in Sámi reindeer pastoralism] where conversations daily focus on nature, environment, reindeer pastures and land areas, weather, pasture conditions, herding and reindeer. This happens in a situation where the distance between conversation, evaluation, decision-making and practice is short. ... I believe that the result of this is that there is no arena outside of the siida who has the same opinions and information to evaluate as the siida.*
>
> (my translation) (Sara, 2007)

7.3.2.3 The siida and the brigade as arenas for sustaining language

The language of reindeer pastoralists also functions to sustain social memory. Both the Nentsy and the Sámi reindeer herders language involves specialised terminology to describe snow conditions, weather, reindeer, terrain and other aspects associated with reindeer pastoralism. The Sámi language, for example, has more than 300 words for describing different snow conditions. The *siida* and the *brigade* are arenas where language is sustained. Both *brigade* 8 and Favresordda *siida* speak only Sámi and Nenets, respectively, with each other. All discussion occurs in pastoralist's native language, enabling knowledge to be sustained in specialised terminology.

7.3.2.4 The siida and brigade as an area for developing place-based knowledge

The *siidas* movement through the same pastures year-after-year encourages the development of detailed place based knowledge. As mentioned in chapter 6, Informant H explained that they move to the same winter pastures not only because of considerations of customary pasture rights, but also because both people and reindeer have become accustomed to these areas. The people have grown up in these areas and have considerable knowledge of the terrain, and how reindeer are likely to move within this terrain.

Brigade 8 also moves to same customary pastures annually. Informants refer to summer pastures as "our summer place". Through movement to same places the organisation develops specific knowledge of the areas used. Enabling herders to predict the movement of reindeer within their allocated areas, and also predict where predators are most likely to affect the herd.

The connection to the specific pastures is thus one aspect though which the *siida* and the *brigade* enhance social-ecological memory.

7.4 Combining different types of knowledge for learning

7.4.1 Combining experimental and experimental knowledge

Folke et. al (2002) emphasize the need for applying both 'experiential' knowledge (knowledge developed through experience) and 'experimental' knowledge (knowledge

developed through conduct of experiments, i.e. scientific knowledge) for learning, as all types of relevant knowledge should be considered for being able to deal with the complex dynamics of a social-ecological system.

7.4.1.1 Traditional knowledge

The *siida* and the *brigade* apply 'experiential' knowledge through the use of traditional ecological knowledge. Traditional knowledge is a broad topic involving many aspects and needs further explanation. One definition of traditional knowledge is

> *A cumulative body of knowledge and beliefs handed down through generations by cultural transmission, about living things (including humans with one another and with their environment. TK is an attribute of historical continuity in resource use patterns.*
>
> (Joks et.al. 2006)

The World Intellectual Property Organisation (WIPO) recognises that traditional knowledge is based on

> *knowledge systems, creations, innovations and cultural expressions which: have generally been transmitted from generation to generation; are generally regarded as pertaining to a particular people or its territory; have generally been developed in a non-systematic way; and, are constantly evolving in response to a changing environment.*
>
> (WIPO 2001: 25)

Reindeer pastoralists are without a doubt traditional knowledge holders. Their entire livelihood witnesses development and application of knowledge of reindeer, nature, climate and human-nature relations. These range from the type of housing used, the adapted method of catching reindeer (e.g. use of lasso), the knowledge behaviour of reindeer, the use of reindeer as transport animals, and so on.

A report prepared by Nordic Sami Institute and Sami University College recognises that "the entire yearly cycles of reindeer pastoralism and work methods is principally based on traditional knowledge" (Joks et.al. 2006: 69). Both the *siida* and the *brigade* apply, without a doubt, experiential knowledge in their daily activities.

7.4.1.2 Appreciation of non-traditional knowledge

The *siida* and the *brigade* do show a willingness, however, to also use scientific knowledge when applicable.

Informant B, the *zoo-teknik*, in *Brigade* 8 is educated in veterinary medicine, and has learned about animal health, reindeer disease and other aspect related to reindeer pastoralism. His opinions based on his education are highly respected in the *brigade*, showing that the *brigade* is willing to apply experimental knowledge.

The aforementioned comment by Informant A, that children gain important knowledge though education that equips them for future challenges, also indicates an appreciation for other types of knowledge in addition to traditional knowledge. I also met other reindeer herder in Yamal who share Informant A's view. During EALAT workshop 1 in Nadym I had the opportunity to discuss with a young couple with only one son. When asked whether they would want their son to take education or to become a reindeer herder, they replied almost unanimously: "both!". They wanted their son would pursue education in order to gain knowledge he could not gain in the *brigade*. However, they hoped that their son would return back to reindeer pastoralism after finishing his education.

Informant (H) explained that the young age of their *siida* leader, and his knowledge of how to deal with papers contributed positively to their *siida*. This also shows an appreciation of non-experiential knowledge. Further, Favresordda *siida*'s decision to start selling calves was based also on scientific recommendations: "we had heard that was good, so we wanted to try" (Informant H).

7.5 The contribution of the reindeer pastoralists social organisation to the resilience of the reindeer livelihood

The *siida* and the *brigade* both show inherit mechanisms for building resilience to climate change. These are embedded in ability to learn from crisis, spreading risk, nurturing social and ecological memory, and combining different types of knowledge for learning. The *brigade* does, however, show greater ability to spread risk through movement than the *siida*. Further, the *brigade* keeps a herd of a more heterogeneous structure than that of the *siida*. This indicates a difference in the level of resilience in the *siida* and the *brigade*, and the *brigade* may be considered as enjoying more resilience. There are, however, as will be discussed in the following chapter, not necessarily factors following from the organisational structure of the *siida* itself, but from the institutional system in which the *siida* operates in. The mechanism for resilience in the siida and the brigade are outlined in figure 7.1

Mechanisms of resilience Embedded in The Social Organisation of reindeer pastoralism in Western Finnmark and Yamal Peninsula		
Indicator of Resilience	***Siida* of Western Finnmark**	***Brigade* of Yamal**
Learning to live with Change and uncertainty		
Evoking ecological disturbance	To a lesser degree thorough nomadic movement	To a lesser degree thorough nomadic movement
Evoking Social Disturbance	No mechanisms	No mechanisms
Learning from crisis	High degree of learning from previous situations of challenging pasture conditions	High degree of learning from previous situations of challenging pasture conditions
Expecting the unexpected (spreading risk)		
- on-field decision making	present in the *siida*	present in the *brigade*
- movement and mobility	some mobility	high degree of mobility
- alternating activities	high degree of alternation	high degree of alternation
- heterogeneous herd structure	tendencies towards a homogenous herd structure	very heterogeneous herd structure
Nurturing Diversity for reorganisation and renewal		
Nurturing ecological memory	Through nomadic movement	through nomadic movement
Sustaining social memory and enhancing social ecological memory	through socialisation, language sustaining, experience sharing and place-based knowledge development	through socialisation, language sustaining, experience sharing and place-based knowledge development
Combining different types of knowledge for learning		
Combining experiential and experimental knowledge	present in the *siida*	present in the *brigade*

Fig. 7.1 Embedded resilience in the social organisation of reindeer pastoralism in Yamal and Western Finnmark

CHAPTER 8 INSTITUTIONAL CONSTRAINTS AND OPPORTUNITIES

8.1 Introduction

Berkes and Jolly (2001:2) argue that the resilience of coupled human-ecological systems is not only dependant on the amount of change a system can undergo and still retain its function and structure, but also "the degree to which a system is capable of self-organisation". As discussed in chapter 3, this thesis investigates the capability of self-organisation through the lens of institutional constraints and opportunities. Institutional constraints and opportunities are, for the purposes of this study, understood as socio-political factors which either facilitate or restrain reindeer pastoralists' ability to self organise according to their traditional knowledge and system of herding.

There are two levels of 'self-organisation' relevant for the purposes of this thesis. The first level is self-organisation at the unit of the *siida* or the *brigade*. In other words the ability of the *siida* or the *brigade* to organise itself and its own work-methods in a manner which secures resilience for projected climate changes. The second level is the ability of the reindeer pastoralism as a whole to self-organise in Yamal and Western Finnmark. This thesis has explored resilience at the level of the *siida* and the *brigade* and concluded that the inbuilt mechanism of the organisational unit of reindeer pastoralism is embedded with a high degree of resilience to projected change. The ability of the *siida* or the *brigade* to self-organise is therefore directly relevant for this thesis.

The ability of reindeer pastoralism as a whole to self-organise is, however, also important for the purposes of this thesis for two main reasons; Firstly, the individual *siidas* and the *brigade*s are parts of a larger system or reindeer pastoralism. The ability of the *siida* or the *brigade* to self-organise is therefore also dependant on the livelihood's ability to self-organise. Secondly, studies have found that ecosystems management under uncertain conditions, e.g. climate change, is most successful if an approach of adaptive co-management between different stake-holders, institutions,

governmental- and non governmental agencies and local communities is pursued (Olsson et. al., 2004). An increase of the reindeer livelihoods ability to self-organise also implies an increase of reindeer pastoralisms' role in management, and the increased use of reindeer pastoralist's knowledge in management processes.

There are distinctive differences between the institutional setting in Yamal and Western Finnmark. This chapter discusses the institutional setting in Yamal and Western Finnmark, and shows how the management systems facilitate or restrain reindeer herders ability for ecosystems-management according to the resilient social organisations discussed in the previous chapter.

8.2 Institutional Constraints and Opportunities in Western Finnmark

Norwegian policy for reindeer pastoralism is outlined in the official white paper (st. Meld no. 26) on sustainable reindeer herding. The whitepaper emphasizes two main policy instruments for regulating reindeer pastoralism; The Reindeer Husbandry Act and the Annual Reindeer Husbandry Agreement.

8.2.1 The Reindeer Husbandry Act - legal definition of pastures

The reindeer husbandry Act is the main policy instrument for regulating and securing reindeer pastoralism in Norway. The aspect of the law most relevant for nomadic mobility is the legal definition of pastures.

Reindeer pastures have traditionally been organized according to an intricate system of traditional pasture rights. Previous studies (Solem 1933; Oskal and Sara 2001) show that reindeer herders have had, since at least the 1740s, a clear understanding of the belongingness of pastures to specific *siidas*, both in terms of summer- and winter pastures, and further that such belongingness is inherited. Marin (2006:224) explains the traditional system in the following manner: "In the traditional system the physical boundaries of each *siida*'s seasonal range were clearly defined, inherited and perpetuated though tradition. The borders did not fluctuate de jure, they allowed

temporary, circumstantial access to a well-defined group of users (the neighbours) according to climatic variability".

This situation corresponds with Ostrom's (1990: 14-15) description of an alternative to centralised control or privatisation of pastures, a situation where herders themselves commit to a cooperative strategy that they themselves work out. The difference between this solution and the above mentioned solutions is that "the participants design their own contract in light of the information they have in hand. The herders, who use the same meadow year after year, have detailed and relatively accurate information about carrying capacity" (ibid). The pastures on Finnmark were traditionally divided according to a private, implicit, social contract between herders.

The legal definitions of pastures have not, however, corresponded with the traditional way of dividing pastures. Legal developments have steadily moved towards a system where a majority of pastures are defined as common pastures. The development was evident already in the Norwegian Reindeer Husbandry Act of 1933, when summer pastures were defined into different reindeer herding districts, assigned to specific *siidas*, while winter, autumn and spring pastures were left as common. The development was strengthened in the 1978 Act, where winter, spring and autumn pastures were formally defined as common pastures (*fellesbeiter*). The effect of this was that pastures which were originally managed through a intricate system of traditional usage rights, were increasingly defined as pastures common, open and unrestricted to all.

The introduction of a commons in Western Finnmark increased the need for a system controlling the use and access to it. Ostrom (1990:10) described the tendency as following: "The proponents of centralized control want an external government agency to decide the specific herding strategy that the central authorities consider best for the situation: The central authority will decide who can use the meadow, when they can use it, and how many animals can be grazed" (Ostrom, 1990: 10).

One measure has been restricting access to seasonal pastures by setting deadlines for when herds need to be out of specific pastures. This was already evident in the 1933 Act, and strengthened in the 1978 Act. This effort was welcomed by reindeer herders at the time, who wanted clearer rules for use of the now 'common' pastures.

The restriction of access to seasonal pastures can be defined as 'an outside factor restraining herders freedom of action' and thus as an institutional constraint. As argued in ch 3, climate change might have an impact on migration times and migration routes due to later freezing and earlier break-up of rivers, as well as altered pasture conditions. Such situation requires flexible access to seasonal pastures. Greater climate variation might also cause migration times to vary year-from year. Controls on the access to pastures may have the effect of degrading resilience, as they restrict the option of using seasonal pastures off-season, a response which is central to the resilience of Yamal reindeer herders. Regulation of pasture times, represents clear institutional constraints on nomadic movement in Western Finnmark, as they represents a removal of the otherwise flexibility function inherit in the organisation of the *siida*. It should be noted, however, that the present system allows for *siida* to apply for dispensation. However, the current system represents a restraining level of bureaucracy which might represent a restriction on the *siidas* ability to self-organise.

8.2.2 Reindeer Husbandry Agreement

A second significant institutional setting in Norway is the annual negotiation of the Reindeer husbandry agreement. As described in chapter 5, the 'reindeer husbandry agreement' is negotiated annually between the Association of Sámi reindeer herders in Norway and the Norwegian Ministry of Agriculture and Food. It is through this agreement that governmental economic transfers to reindeer pastoralism are provided.

The setting though which these negotiations take place, may however facilitate institutional constraint for reindeer pastoralism at the livelihood-level. First and foremost, the setting can be viewed upon as unequal, a notion supported by Dr. Erik Reinert's (2007: 195) description of his experience as advisor to Sámi herders in annual negotiations for the Reindeer Husbandry Agreement in the end of the 1990s:

> *The setting was unequal. On one side of the table were representatives of all the many ministries involved and the Sámi Parliament (as part of the 'government'), and on the other side the tiny aboriginal organisation [Association of Sami Reindeer Herders in Norway], having one and a half employees at the time, and myself.*
>
> (Reinert 2007: 195)

The negotiations are formally a negation between an industry (reindeer pastoralism) and the state. However, the government party in these negotiations, the Ministry of Agriculture and food, may also be seen as a representative of reindeer pastoralisms' competitor industry, namely agriculture.

Reindeer pastoralism and agriculture may be viewed upon as competitors for two reasons: 1) reindeer pastoralism and agriculture compete for access to areas in several locations, and; 2) both reindeer husbandry and agriculture are meat-producing industries, selling complementary goods. Area-conflicts in Western-Finnmark between reindeer pastoralism and agriculture are most intensive in the coastal summer pasture areas, where sheep farmer and reindeer herders often use the same areas for grazing their animals, and where agricultural developments are more extensive than in the winter pastures in Guovdageaidnu. Further, agriculture's expansion to adjacent industries, such as tourism, has increased the bit-by-bit encroachment of reindeer pastures. Indeed Nelleman et al. (2001) study recognised that traditional grazing areas of Finnmark have been subjected to increasing encroachment hydropower development, cabin resorts, forestry and mineral exploration.

The unequal setting of the Reindeer Husbandry Act negotiations represents a constraint on the livelihoods general ability to self organize, as the setting discourages a system of adaptive co-management.

At the *siida* level, the economic transfers of the Reindeer Husbandry Agreement have consequences for the resilience of *siida*s to projected climate change. As mentioned in chapter 6, there are several types of subsidies given to reindeer pastoralism. Most aimed at controlling the size and structure of reindeer herds, as it is considered that there are too many reindeer, especially in Finnmark. The economic incentives for calf-slaughtering might have effects on the herd structures in Finnmark. In relation to future climate change, a heterogeneous herd structure is a measure for spreading risk, and increasing the resilience towards, among other things, challenging pasture conditions due to altered snow conditions.

8.2.3 The use of grazing models for policy construction

The tragedy of the commons metaphor, as described by Hardin (1968:1244) can be summarized as following: In a situation where herders are using pastures "common to all", they will be are rationally inclined towards adding more and more animals to their herd without regarding the so-called carrying capacity of the pastures. This situation arises because the benefit of adding one more animal to his herd is enjoyed solely by the herder, while the costs of over-usage of the pastures are shared by all. In other words, the private ownership of the cattle (or in this case, reindeer), and the collective usage of the pastures cause a situation whereby herders are inclined towards over exploitation of pastures.

This model has played a strong role in the formation of Norwegian reindeer husbandry policy. The Norwegians government official White Paper on Reindeer Husbandry (St. meld. 28, 1991-1992: 37-38) described the organization of reindeer pastoralism as following:

> *Pastures are seen as common unrestricted resource, while ownership of animals rests with the individual herders. This creates a fundamental danger for that [pasture] resources are over-exploited. From the perspective of the individual herders it is advantageous to increase his/her production, as long as the disadvantages [of over exploitation] are equally*

divided among all herders. Strategically it will be advantageous to increase one's the number of reindeer even if all other parties do the same leading to collective loss for the industry, as this will prevent one being left with only the disadvantages rising from too many reindeer on the pastures in general. The combination of demographic and socio-economical relationships leads to a situation where uncontrolled increase in numbers of reindeer is easily the result.

(St.meld 28 (1991-92): 37-38)

The use of the tragedy of the commons metaphor in the case of reindeer pastoralism has been widely challenged by several academics (Paine, 1992, Marin 2006). Paine (1992), for example, argues that the tragic situation in reindeer pastures of Norway is caused by paternalistic state policy imposed on reindeer pastoralists, who are prevented from making their own independent herding and husbandry decisions. Thus the tragedy is constructed by the Norwegian government itself and not by reindeer pastoralists. The relevance of terms such as 'carrying capacity' for reindeer pastures has also been widely challenged (Stammler, 2005; Joks et al., 2006)

Internationally, the use of the tragedy of the commons metaphors for policy construction has been challenged, most prominently by Ostrom (1990: 6-7): "What make these models do dangerous – when they are used metaphorically as the foundation for policy – is that the constraints that are assumed to fixed for the purposes of analysis are taken on faith as being fixed in empirical settings, unless external authorities change them. ... Not all users of natural resources are incapable of changing their constraints".

Indeed, the simple comparison of the tragedy of commons dilemma reindeer pastures in Western Finnmark is intrinsically flawed. The assumption that reindeer pastures are commons open to all disregards the intricate system of traditional rights to pastures in place in Western Finnmark, as described in chapter 5.

The use of such models for policy development represent a threat to the resilience of reindeer pastoralism as such models tend to favour centralized control and degradation of opportunities for self-organisation. Increased centralised control may have effects on increasing different regulations of reindeer pastoralism.

8.2.4 Institutional opportunities in Western Finnmark

Developments in the institutional setting of Norway may provide potential institutional opportunities for facilitating resilience.

The establishment of the Sami Parliament in 1989 represents a potential opportunity for increased self-governance in reindeer pastoralism. The Sámi parliament is elected by the Sámi every four years in conjunction with Norwegian general election. The Sámi parliament consists of 43 representatives elected by direct vote. The first election was held in 1989. The Sámi parliament is now in its fifth period, 2005-2009. Although the parliament is granted limited direct powers, it works as an advisory body for the Norwegian government in issues concerning the Sámi minority. It is intended to have a leading role in the political development of the Sámi, as well as being a representative for the Sámi people in the face of the government and the majority population. Among the political parties running for the last elections, two parties explicitly ran as parties representing the interests of Sámi reindeer pastoralists: *Badjeolbmuid Listu* (reindeer peoples' party) and *Johttisápmelaččaid Listu* (nomadic reindeer peoples' party). The linkages between the Sámi parliament and Sámi reindeer pastoralism represent a potential opportunity for increased ability to self-organize though increased opportunities for co-management.

So-far the Sámi parliament has, however, had a modest role in issues concerning reindeer pastoralism. Perhaps also due to the livelihoods own careful approach to the Sami Parliament. Realization of the potential institutional opportunities following from the Sámi parliament depends on whether future developments lead to a strengthened role of the Sámi parliament in issues concerning reindeer pastoralism. The Sámi Parliament is, first and foremost, a parliament for the collective Sámi population, a

population in which Sámi reindeer pastoralists can be view as a minority-within-a-minority. The ability of the Sámi parliament to function as an institution of self-governance depends on the political position of the livelihood's interests in the Parliament, and also the parliament's willingness and ability attend to the reindeer herders need for flexibility and adaptability.

Another potential institutional opportunity for increasing the resilience of reindeer pastoralism level in Western Finnamrk is the Finnmark Act, which came into force in 2006. Through the Finnmark Act, 96% (45 000km2) of the area of Finnmark, previously own by the Norwegian state, was transferred to the population of Finnmark, represented by the newly established Finnmark Estate (*Finnmakrseidendommen*). The Finnmark estate is an independent legal subject like private property owner. The body is led by a board consisting of 6 persons, three appointed by the county parliament (*fylkestinget*), and three appointed by the Sámi parliament. Among these, reindeer pastoralism has one representative.

Reindeer pastoralism's presence in the board of Finnmark estate represents a potential oppoertunity for co-management in Finnmark. In a case study conducted in Canada, Berkes and Jolly (2001:12) found that regional co-management arrangements provide greater northern indigenous participation in environmental management, and that these powers provide greater local flexibility and response capability in dealing with uncertainties such as climate change. If the arrangement though the Finnmark Estate increase local indigenous involvement in environmental management, similar benefits could be experienced in Western Finnmark. However, also the Finnmark Act and the establishment of Finnmark Estate are relatively new developments. The so-far experienced effects of this development are preliminary. It is therefore difficult to establish whether the potential institutional opportunities offered through the Finnmark Estate will be fully realized.

The new Norwegian Reindeer Husbandry Act of 2007 also represents a potential institutional opportunity for enhancing resilience of reindeer pastoralism. As

mentioned in chapter 5, the act grants the *siida* a juridical status, thus strengthening the legal position of the traditional unit of organizing reindeer pastoralism. This could contribute to strengthening the resilience of reindeer pastoralism by revitalizing *siida*-arrangements through which pastures were traditionally organized. As mentioned earlier, this Act is still relatively new, and no evaluations of the effects of this law have been conducted. It is therefore yet not possible to determine whether the potential institutional opportunities provided by this Act will be fully realized.

8.3 Institutional Constraints and Opportunities in Yamal

The pasture resources in Yamal are not legally defined as 'commons' in the same manner as in Western Finnmark. The pastures on Yamal are split between three *sovkhozy* which hold the only long-term land titles, and hold titles of unlimited use right (Stammler 2005). The *sovkhozy* have granted relative autonomy to the *brigadiers* in deciding upon migration strategies and herd structure. These factors represent an institutional opportunity for the *brigade* of Yamal in the face of climate change, as these factors 'facilitate herders' freedom of action'. As argued earlier, climate change may alter pasture condition and migration times. The ability of *brigades* to exercise flexibility in terms of migration strengthens the *brigades* capability of responding to consequences of climate change.

It cannot be ruled out that the tragedy of the commons model has also been used for policy construction in Yamal. The closest evidence of the application of the 'tragedy of the commons' model to reindeer pastoralist policy is the application of the concept 'carrying capacity' in the law on reindeer herding: "The maximum size of the main reindeer herd shall not exceed the reindeer carrying capacity of the land which is reserved for the user of land" (YNAO law no. 46: §13, where 'carrying capacity is defined as "an index which characterises the amount of reindeer which can be kept on a given spot during a fixed period of time without damaging the deposits of forage resources on the reindeer pastures" (YNAO law no. 46: § 2). However, there do not seem to be any regulations or directions for herd structures, herd sizes and pasture times in Yamal.

One difference between the Yamal Nentsy situation and the Western Finnmark herders is that Yamal Nentsy are experiencing stresses relating to oil and gas extraction on land, and might in the future experience stresses related to Northern Sea Route coastal development made possible by climate change (McCarthy et. al. 2005: 962). Reindeer herders are not necessarily opposed to oil and gas development, but point out the need for co-operation in order to facilitate co-existence on the tundra, where both herders and oil companies can conduct their industry. Informant A who has summer pastures in the area where, perhaps, the greatest gas development in Yamal is under establishment, the Bovajenkovo field, explains his view of the developments:

> *I am not against gas companies. I know that they are here and I am not against them ... But if we are to live together there must be understanding ... we must talk, understand, and we must live together.* (Informant A)

Bit-by-bit encroachment of areas vital to reindeer pastoralism is a major challenge for the *brigade*. However, as indicated by informant A above, there is an opportunity to degrade the damaging effects through communication and cooperation. The lack of strong institutional arenas where communication between the gas developers, and the reindeer pastoralists who are directly affected by each development could potentially degrade the damaging effects on resilience gas development could have. An institutional opportunity here is to develop linkages where communication and co-management can take place. Walker and Salt (2006) argue:

> *The Adaptive capacity of a social-ecological system is enhanced when complex issues can be dealt with by a network of loosely connected stake-holders located at different levels of society. Such dynamic structure allows for flexible coordination and cross-scale responses to solving problems because there is experimentation and learning going on across the network. Such experimentation, combined with the networking of knowledge, creates a diversity of experience and ideas for solving new problems.*
>
> (Walker and Salt 2006:138)

8.4 The Effects of Institutional Constraints and Opportunities on resilience of reindeer pastoralism in Yamal and Western Finnmark

Resilience to climate change can be enhanced or restrained by the institutional setting, through enhancing or restraining a system's ability to self organize (Folke et. al. 2002). Institutional developments are equally important for reindeer pastoralism's ability to adapt to projected climate change, as the resilience embedded in its social organization is. Institutional developments can potentially strengthen the effects of climate change, by degrading options for flexibility and adaptation.

As discussed in chapter 2, projected climate change in Yamal and in Western Finnmark could, among other things, potentially affect migration times and migration routes, as well as affected pasture accessibility through altered snow conditions. The need to ensure that options for future flexibility are not degraded can therefore be argued to be stronger than ever before, as projected changes exceed climatic changes in the recent past.

Berkes and Jolly (2001: 13) recognize that "New institutional linkages can ... increase the resilience of the social-ecological system by providing for cross scale communication that did not exists before ...".

In Western Finnmark, the definition of pastures as commons, followed by ridgid regulations of pasture use can have constraining effects on the resilience of reindeer pastoralism. An effect of the present system of pasture distribution in Western Finnamrk is that Sami reindeer herders canot easily use seasonal pastures of season, like their colleagues in Yamal. A strategy which, as argued in chapter 7, represents an important aspect of the resilience of Yamal reindeer herders. Marin (2006: 229) found, his study of the reindeer husbandry policy in Norway: "In Finnmark, the herders point out their need for secure access to resources, more than a formalised tenure system. They argue for a system that allows flexibility in using the resources according to variability and that at the same time provides a swift and efficient way of regulating

access to a resource". The described system is in accordance with the traditional reindeer pastoralist system of dividing pastures. Ostrom argues:

> *Appropriators frequently devise their own rules without creating formal governmental jurisdiction for this purpose. ... Provided that external governmental officials give at least minimal recognition to the legitimacy of such rules, the [arbitrators] themselves may be able to enforce the rules themselves. But if external government officials presume that only they have the authority to set the rules, then it will be very difficult for local appropriators to sustain a rule-governed CPR [common pool resource] over the long run. In a situation where one wishes to get around the rules created by [local appropriators], one may go to the external government and try to get local rules overturned.*
>
> (Ostrom 1990:101)

A strengthening of the legitimacy of the traditional system could be a step on the way for degrading the institutional constrain provided by the current distribution of pastures.

In the western Finnmark case, international developments such as the Sámi Parliament, the Finnmark Act and the new reindeer husbandry Act of 2007 provide potential opportunities for preserving the resilience of reindeer pastoralism, provided that these developments attend to reindeer pastoralism's need for flexibility.

In Yamal, the lack of a formal institutional setting whereby the gas industry and reindeer herders can communicate on relation regarding development of gas installations represents a potential institutional constraint. Reindeer herders in Yamal describe installation causing disturbance which could have been ameliorated by choosing a slightly different location for the installations, or by considering making spots where reindeer and pastoralists can cross infrastructure such as roads and pipelines. As projected climate change might cause disturbance on migration routes

and times, the need for flexibility is strong in Yamal. Further obstacles created by the gas development could strengthen the effects of climate change by degrading this flexibility.

A potential institutional opportunity for Yamal herders is developing institutional linkages for communication with gas companies, provided that gas companies are truly willing to cooperate.

CHAPTER 9 CONCLUSIONS

9.1 The findings of this study

This thesis has investigated the whether there is resilience embedded in the social organization of reindeer pastoralism. Further, the thesis investigated whether the institutional setting can restrain or facilitate resilience through providing constraints or opportunities. The answers to these questions where sought through the use of two case studies, the 8th *Brigade* of the Yar-Salinskii enterprise in Yamal, Western Siberia, and Favresordda *siida* of Western Finnmark in Northern Norway.

The study showed that the organizational units of the Sámi *siida* and the *brigade* in Yamal have strong structural ties. Despite the fcat thaht these two function in completely different settings, the basic principles according to which reindeer pastoralism is practiced were near identical. Stammler (2005; 327) noted about the social organization of Nentsy nomads: "None of the many changes that have impacted on the social and economic environment of the Nenets nomads, such as the coming and going of two empires, massive state interference, even Soviet institutionalisation, has managed to replace their own important principles of relating flexibility to their animals and environment." Indeed it is the mechanisms for flexibility that provided the most similar between the *brigade* and the *siida*. These mechanisms for flexibility are also the mechanism in which resilience to climate change is embedded.

This study also supported findings that, *siida*s and *brigade*s have shown great resilience to climatic variations in the past. Further, findings indicate that the *siida*s and the *brigade*s certainly hold the necessary resilience to meet the likely challenges caused by climate change in the near future (around 30 years), as these are changes which comply to the type of variations reindeer pastoralists have faced before. Resilience is, however, also depended on that the social organization does not change or develop in a manner which degrades the embedded mechanisms for resilience in reindeer pastoralism.

Further, the study showed that non-climate factors might have an impact on the resilienc of reindeer pastoralism to climate change. Indeed, reindeer herders in Yamal and Western Finnmark did not express particular concerns over projected climatic changes. Herders in both areas were more worried about non-climate factors, specifically the large-scale loss of pastures in Yamal and bit-by-bit encroachment in Finnmark.

Further this thesis found that resilience may be constrained by institutional settings, and found that resilience to projected climate change could potentially be facilitated by strengthening or developing institutional links in both the regions investigated.

In Western Finnmark the system of use and distribution of pastures provided by the reindeer husbandry Act of 1978, and enhanced through the annual negotiations for the Reindeer Husbandry Act, could potentially have restraining effects of reindeer pastoralism's resilience towards future climate change. For example, future climatic conditions might call for the availability of the option to use summer pastures in the winter time if pasture conditions deteriorate. The current system of distribution and use of pasture do not easily allow for such options.

In Western Finnmark the links for local-self governance provided by the Finnmark Act represents one potential opportunity for facilitating resilience to projected climate change. Self-organisation is a mechanism though which flexibility and resilience are enhanced. This is depended on the continued strengthening and involvement of reindeer pastoralism in the Finnmark Estate, providing that reindeer pastoralism need for flexibility are attended to.

The new Reindeer Husbandry Act of 2007, strengthening the legal status of the *siida,* represents another potential institutional opportunity for enhancing resilience for future changes. However, as this Act has newly entered into force the effects of this act remain to be established.

Contrasting to the central management system though Ministry of Agriculture and Food, the Sámi parliament of Norway represents an additional potential institutional opportunity, through which local-self governance could be enhanced and reindeer pastoralism's opportunities for self-organisation could be strengthened. The enhancing of local-self governance also provides opportunities for the application of traditional ecological knowledge in environmental management.

If the projections for future climatic change in Yamal (see fig 2.1) prove to be correct, Yamal will, in 2100, have a climate similar to that of Karasjok in Finnmark today. Reindeer pastoralism should be able to adapt to such changes, provided that traditional knowledge and traditional pasture use is continued.

In Yamal, the loss of pastures following from oil and gas extraction could provide a challenge for the future ability for the *Brigade*s to move freely. Institutional linkages between reindeer herders and oil companies could degrade the challenges following from loss of grazing land. Improving networks between family-based reindeer pastoralism and oil and gas companies could have beneficial effects. The creation of communication arenas between the reindeer herders who are directly affected by an installation, and the developers of such installations could enhance options.

An oil influenced reindeer pastoralism in Yamal might increase mechanization and profit-maximization of reindeer pastoralism in Yamal could potentially have effects on resilience. Increased mechanization, and the altering of herd structures towards selling of calves and profit maximization, could degrade options for future adaptation and flexibility, by ameliorating traditional responses to uncertainty and change, such as a heterogeneous herd structure. Further, increased mechanization could lead to de-coupling the human-ecological system, where by the linkages between humans and the environment are degraded.

The private ownership of parts of the herd could provide a positive effect on resilience, by as private ownership could potentially have positive effects on the incentives of herders to take care of the reindeer and seek adaptive and flexible responses to experienced change.

9.2 Knowledge gaps

The study revealed several questions yet to be answered. This section provides an overview of the knowledge gaps which should be addressed in order to determine how resilience, social organisation, climate change and non-climate factors are related in reindeer pastoralism.

First of all, although the study concludes that reindeer pastoralists hold the necessary resilience to meet challenges caused by climate change in the near future, it cannot conclude whether reindeer pastoralism would be able to adapt to more abrupt and rapid changes than those projected by Benestad (unpublished). If more rapid change is shown to be likely, a more detailed study of the reindeer pastoralists' social organisation must be conducted.

Further, this study has focused on the *brigade* in Yamal. It must be noted that a majority of herders in Yamal do not work in the *sovkhoz brigade*s, and do not, for example, receive salary or enjoy any property rights what-so-ever on the Yamal peninsula. A study of the private reindeer herders of Yamal should be conducted in order to determine how these are able to face likely climate change.

This study showed that the current climate in Western Finnmark is approximately in the temperature scale of what Yamal is projected to experience in 2100, giving at least an indication that reindeer pastoralism could be conductible in Yamal despite projected changes. Further case studies of reindeer pastoralist regions which currently have warmer winter temperatures than western Finnmark could provide interesting insights, and help reindeer pastoralists of Western Finnmark to prepare for projected climate change.

Secondly, the process through which institutional linkages develop, and through which institutions learn could be further investigated in both the Western Finnmark case and the Yamal case. The effects of newly established institutions in YNAO (for example a new educational institution in Salekhard) are yet to be determined. The same is true for the recently established institutional bodies in Western Finnmark.

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