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WHAP "EALAT"

EALÁT

REINDEER
HERDERS'
VOICE:

Editors: Anders Oskal,
Johan Mathis Turi,
Svein D. Mathiesen
and Philip Burgess

Reindeer herding, traditional
knowledge and adaptation to climate
change and loss of grazing land



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SDM

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FOREWORD

By Anders Oskal, Director of International Centre for Reindeer Husbandry and Project Leader of EALÁT-Information

This book is a two years middle term report from a Norwegian information project in the Arctic Council entitled EALÁT. The term «*ealát*» is from the language of the indigenous Sámi people of Fennoscandia, and means «*good pasture*». This word is related to the term «*eallu*», which means «herd» and the origin of these terms derives from the word «*eallin*», or «life». In other words, pastures are the foundation for the reindeer herd, and reindeer herds are the foundation for the lives of reindeer herding peoples.

Reindeer herding is the primary livelihood for over 20 indigenous peoples throughout the circumpolar North, with a remarkably similar organisation wherever it is found. In all, nearly 100,000 people are involved in herding approximately 2,5 million domesticated reindeer in 9 national states. Reindeer herding can be seen as a human-coupled ecosystem with a historically high resilience to climate variability and change, and a circumpolar model for sustainable management of the marginal areas of the North.

Indigenous peoples in the Arctic now face major challenges related to changes in their societies, globalisation and a changing climate.

EALÁT has therefore been initiated by the Association of World Reindeer Herders (WRH) to address the challenges of climate change and loss of pastures, in order to maintain and develop robust reindeer herding societies for the future.

The project is endorsed by the Sustainable Development Working Group (SDWG) of the Arctic Council, with the full title «*SDWG EALÁT-Information: Reindeer herding, traditional knowledge and adaptation to climate change and loss of pastures*». This is an information project focusing on climate change, loss of pastures and how the traditional knowledge of reindeer herders themselves can be utilized to adapt to these changes. The aim is to build capacity and competence for adaptation in local reindeer herding communities, as well as to increase knowledge on these issues for national authorities, the Arctic Council system, industrial developers, and mainstream societies in the North. EALÁT-Information is also a part of the IPY EALÁT-Network Study¹, a broader consortium endorsed by the International Polar Year which focuses on the vulnerability of reindeer herding to climate change.

EALÁT-Information is initiated, planned and implemented by the Association of World Reindeer Herders and the International Centre for Reindeer Husbandry². Other partner

¹ www.ealat.org

² www.reindeerportal.org



Anders Oskal in Chukotka.

AK.

organisations and institutions that are involved in the project include the Saami Council, the Reindeer Herders' Union of Russia, the Sámi Reindeer Herders' Associations of Norway and Finland, the Reindeer Herders' Union of Yamal, the Reindeer Herders' Union of the Republic of Sakha (Yakutia), the Reindeer Herders' Union of Chukotka, RAIPON, the Norwegian Meteorological Institute, the Arctic and Antarctic Research Institute in St. Petersburg, the Russian Science Academy, NASA, the Norwegian School of Veterinary Science, the Sámi University College, the University of the Arctic, the Arctic Portal and others. There have also been important contributions from various national and local authorities, both in Norway, Finland, the Yamal-Nenets Autonomous Okrug, the Republic of Sakha (Yakutia) and the Chukotka Autonomous Okrug. The project has been financed by the Norwegian Ministry of Foreign Affairs, the Nordic Council of Ministers, the Finnish Ministry of Foreign Affairs, the Research Council of Norway, the Norwegian Ministry of Labour and Social Inclusion, and the International Centre for Reindeer Husbandry.

The project will continue through the Norwegian and Danish chairmanships of the Arctic Council, with a timeframe from 2007 to 2011. This book is to be presented as a middle term report at the 6th Ministerial Meeting of the Arctic Council, while the final report will be presented under the Danish chairmanship.

The EALÁT-Information project is arranging a series of community-based workshops in local reindeer herding societies across the Arctic, where reindeer herders from different areas, scientists and local authorities are

brought together to address the challenges of climate change and land use change while focusing on adaptation and traditional knowledge. Seven such workshops have been held in 2007 and 2008 in local reindeer herding communities in Norway, Finland and Russia. This book is exclusively based on materials and pictures from the community based workshops and EALÁT activities. The goal of EALÁT-Information is to bring the voice of reindeer herders to the Arctic Council.

In terms of pastures, local climate and topographic conditions the diversity is high in the regions investigated in this project spanning Fennoscandia, the Yamal tundra, the Verkhoyansky mountains, the Aldan taiga and the tundra of Chukotka. This indicates that the adaptive capacity of reindeer herding may be high. The challenge of SDWG EALÁT-Information is to take reindeer herders' knowledge into action for sustainable development of the Arctic and, in particular, to actively involve circumpolar reindeer herders in this process. This book intends to offer a small snapshot of how indigenous reindeer herders and their societies look upon the challenges of adaptation to climate change and development of the Arctic.



Johan Mathis Turi in Aldan. AX.

EALÁT – A MODEL FOR LOCAL COMPETENCE BUILDING IN THE NORTH

By Johan Mathis Turi, Founding President and current Secretary General of Association of World Reindeer Herders (WRH) and initiator of EALÁT.

Reindeer herding peoples have lived and worked across wide areas of the north since time immemorial. In doing so, they have accumulated unique knowledge about the natural environment in which they live. Today, reindeer herding communities everywhere are facing profound changes in their societies. The challenges of climate change, increased development and globalization are of such proportions that we need to use the best available knowledge in order to adapt for the future. Obviously, scientific research has been and will continue to be very important. But often the best available knowledge is actually the knowledge embedded within reindeer herding communities: Traditional knowledge developed by centuries of close observation of reindeer and nature which has been handed down from generation to generation. Reindeer herding peoples have always known that they must work in collaboration with nature, not against it.

This project is a follow up to two earlier Arctic Council projects³, though this endeavour has an even stronger ownership and leadership by indigenous peoples themselves. The Association of World Reindeer Herders see this project as

an important long-term contribution towards capacity building in reindeer herding societies with a special focus on adaptation to the challenges of climate change and loss of pastures.

The EALÁT consortium is a unique research and documentation project, where traditional knowledge and scientific knowledge are treated on an equal footing and traditional knowledge is seen as more than just a supplement to scientific knowledge. The EALÁT project will contribute to the sustainable future management of reindeer husbandry by documenting Arctic reindeer herding peoples' traditional knowledge, but also intends to illuminate adaptation tools for a changing climate that is already impacting northern communities. EALÁT is also a project that acts as a venue where reindeer peoples can cooperate among themselves and with international research and educational institutions in bringing forth new knowledge.

Traditional Knowledge (and local knowledge) is based on experience and is knowledge that is accumulated in people's memory and actions over multiple generations. Therefore, it is knowledge that is actually validated in the same way that scientific knowledge is found valid through trial and error. The crucial difference between them lies in how knowledge is obtained.

From the beginning, human societies have

³ Sustainable Reindeer Husbandry (2002). Family-Based Reindeer Herding and Hunting Economies, and the Status and Management of Wild Reindeer/Caribou Populations (2004).

been built on the application of traditional knowledge – from the first settlements, to early barter systems and to the establishment of trading networks. As scientific knowledge developed and brought extraordinary results in almost all fields, a shift in people's attitudes towards traditional knowledge occurred and it gradually became devalued.

Today, views regarding traditional knowledge have evolved. The global community has again begun to demand the implementation of local and traditional knowledge, and institutions such as the United Nations require and encourage that traditional knowledge be embedded into the management of the natural environment⁴. This change in attitudes has a clear connection to the challenges that our world is facing. Both leaders and citizens have begun to realize that we need more comprehensive perspectives regarding the management of our natural environment. This is a field where traditional knowledge and scientific knowledge have the potential to complement each other. Together they provide us all with a fuller and more comprehensive insight into our living world.

Because herding peoples have a unique knowledge of the climate and natural environment of their regions and they inhabit places where climate change is expected to be most dramatic, their knowledge is of particular value today. The world's demand for precisely the kind of knowledge that reindeer people possess – holistic and long term – has dramatically increased in recent years.

Traditional knowledge is characterized by the fact that it has not been written down. As

a result, people often perceive it to be something very diffuse and difficult to use. Therefore, one of the project's main tasks is to make traditional knowledge available to more people. Another major task we face is to see the implementation of traditional knowledge alongside scientific knowledge in governance, public plans, industrial development projects and so on. Of course, there are a great number of specific challenges that have to be met in this process. There are issues of ownership, intellectual property rights, documentation issues, ethics, storage questions, and the need for an enhanced understanding from the academic and professional community on the handling and understanding of traditional knowledge. As a result, we have sought collaboration with all levels of research and other academic institutions.

Traditional knowledge needs to remain where it is developed. This ensures that traditional skills are developed locally and not far from the communities that brought them forth. This is a guarantee that knowledge remains where it is needed, and that local communities get the benefits from the knowledge developed. Another benefit is that «meeting places» for people and relevant professionals are created and nurtured. By creating «communities» where local knowledge meets theory-based knowledge in an active manner, one can build up local expertise, strengthen the robustness of local communities and enhance the efficacy of local adaptation strategies. The aim is to empower reindeer herders and the communities in which they live with the best technologies available, combined with traditional skills and

⁴ Rio Declaration 1992, Convention on Protection of Biological Diversity, 1992. Arctic Council Arctic Climate Impact assessment (ACIA) report, 2005.

knowledge to further enhance the development of sustainable reindeer husbandry. This is the essence of the EALÁT project.

Traditional areas of reindeer husbandry have only recently become interesting for other interests such as the oil and gas industry. Even though it can severely disrupt the livelihoods of reindeer herders, oil and gas development may not be the worst thing that can happen to reindeer husbandry: In contrast to alternative sources for energy that affect our animals such as windmills and hydro-electric power plants, oil and gas development can prove to be profitable. Such development can provide a financial foundation for the positive development of reindeer herding societies. This opening up of the Arctic as a source of energy truly represents a «tidal wave» for the indigenous peoples of the Arctic. There is a saying that «the tide lifts all boats». However this wave will only lift those boats that are seaworthy. Small, ill prepared indigenous communities risk being swamped by this wave so it is important that they are equipped with the tools they need to adapt to these changes. That way they may continue to thrive when this wave of petroleum development recedes. Reindeer husbandry has been an important livelihood for people in these areas from time immemorial, and must continue to exist also after the resources have been exploited. To this end, local capacity building in indigenous reindeer herding societies is essential.

It is important to remember that knowledge grow roots where it is developed and used. Indigenous peoples should therefore have the right to develop their own strategies

for adapting to climate change and this goes hand in hand with the right to develop their own knowledge and research institutions. Therefore, as a continuation of these efforts, the Association of World Reindeer Herders and the International Centre for Reindeer Husbandry has taken the initiative to establish a University of the Arctic Institute for Circumpolar Reindeer Husbandry (UArctic EALÁT Institute) as a legacy of the International Polar Year.

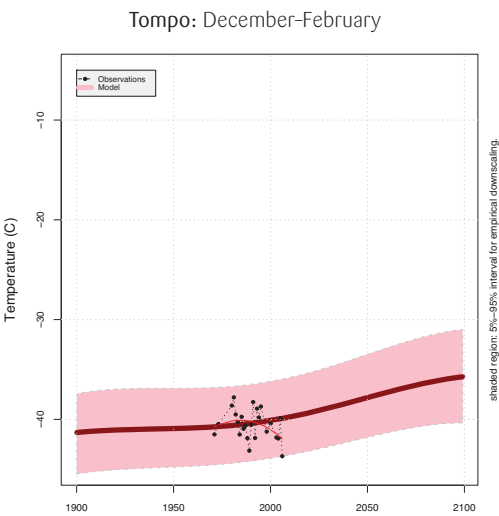
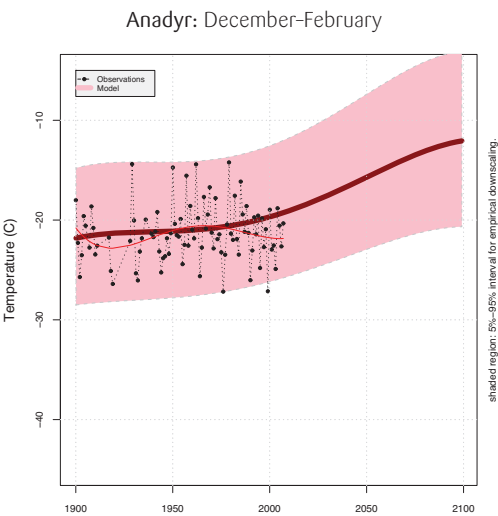
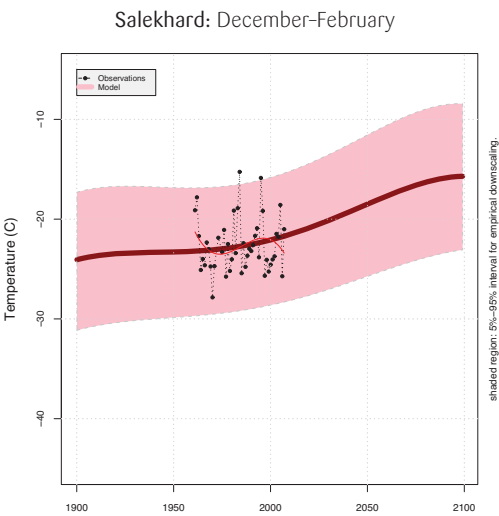
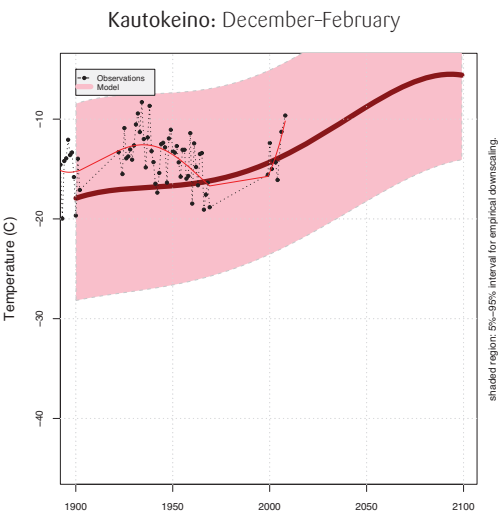


Dignitaries at the opening of the Indigenous Peoples International Polar Year opening. From the left: former Sámi University College Rector, Mai-Britt Utsi, Mayor Klemet Erland Heatta, former Minister for the Environment Helen Bjørnøy and former President of the Norwegian Sámi Parliament, Aili Keskitalo. KU.

Statistical downscaling of climate data - projecting the future in circumpolar reindeer pastures:

The red line is expected mean winter temperatures (December, January, February) over the next 100 years, in Kautokeino, Salekhard,

Tompo and Anadyr. The dotted grey lines are observed temperatures past 100 years. The thin red line plots the mean of these observations.



These graphs are created by downscaling (downscaled IPCC-models, SRES A1b) which is a term for detailed examination of how the maximum/minimum winter temperature has changed in the past (symbols shaded in red). Also shown are predictions made with global climate models (GCMs), subject to statistical downscaling. Predictions are made both for the past (1900–2000) and the future (2000–2100). Since the GCMs need to make a number of approximations and the precise initial starting conditions are somewhat uncertain, the models only give an approximate description of what the local temperature will be (this is referred to as «uncertainty»). However, statistics derived from a number of different GCM predictions can provide a good description of the lower and upper bounds of what the temperature will be. This data suggests that by 2050, for example, a warm winter in Yamal will be similar to a cold winter in Finnmark. This

will possibly affect snow conditions and snow cover, which can also affect the growth of plants and lichens.

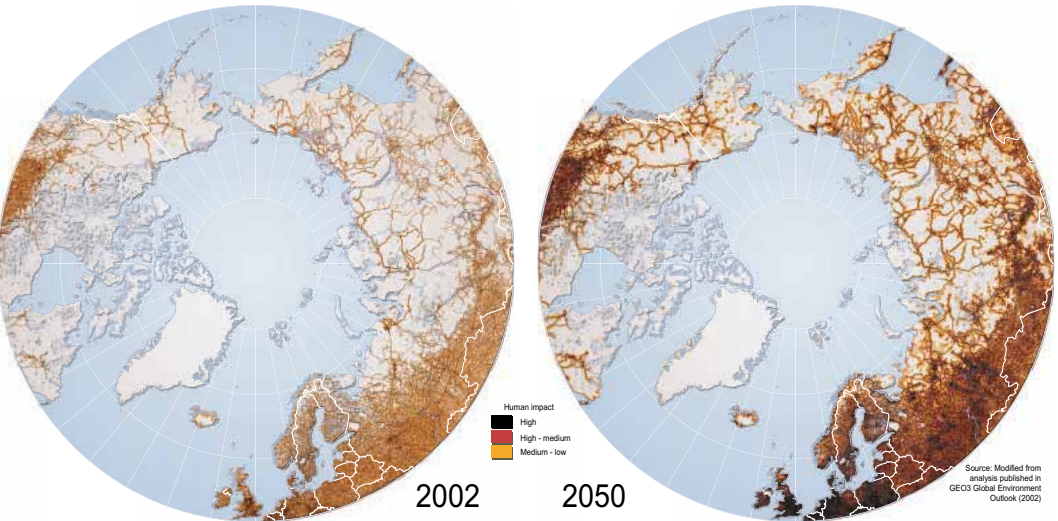
Source: Benestad, 2008

Arctic development scenarios, human impact in 2050

Human activities influence the environment and reduce the value of forests, tundra and plains in terms of original biodiversity and habitat. Primarily larger mammals are hit by the fragmentation caused by roads and pipelines. The GLOBIO methodology has modeled the future impact of human activities in the Arctic, as seen in this map. Infrastructure and settlements are used as proxies for human activities, using the GLOBIO model from the Global Environment Outlook 3.

Source: Modified from analysis published in GEO3 Global Environment Outlook (2002)

Cartographer: Hugo Ahlenius, UNEP/GRID-Arendal





RECOMMENDATIONS

Preliminary recommendations of Arctic Council Sustainable Development Working Group (SDWG) EALÁT-Information

Based on the work of the SDWG EALÁT-Information project in 2007–2008 including the 7 community-based workshops held so far, and based on a vision of a future sustainable and resilient circumpolar reindeer husbandry, the following preliminary recommendations to the SDWG has been made:

- It is important to support knowledge sharing on impacts and adaptation measures connected to climate change and loss of grazing land, while also recognizing the value of traditional knowledge as a foundation for adaptation.
- It is important to support capacity building for indigenous societies facing climate change and loss of grazing land, both in

terms of supporting recruitment of young scientists from reindeer herding communities, and in terms of supporting institution building in local reindeer herding communities for local competence building.

- We are concerned about the explosion of human activity linked to climate change and loss of grazing land for reindeer and caribou. Grazing land used for reindeer has to be protected as an adaptive measure to climate change and sustainable Arctic societies.
- It is important to define institutional mechanisms which constrain indigenous peoples' original resilience and ability to adapt to climate change.



Sat. Imagery
by NASA



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The Sámi village of Kautokeino. KEH.

SÁPMI:

KAUTOKEINO, NORWAY AND INARI, FINLAND

Inger Marie G. Eira, Ole Isak Eira, Rávdnó Biret Márja Eira, Anne-Maria Magga, Nils Jonas Ketola, Elen Anne Sara.

Sápmi refers to the traditional area inhabited by the Sámi people before the creation of the national borders of what is today called Norway, Sweden, Finland and Russia. There have been two EALÁT-Information workshops in Sápmi. The first workshop coincided with the opening of the Indigenous Peoples International Polar Year in Kautokeino (Feb 16–17, 2007) and had approximately 70 participants. The second was held near the village of Inari (22–3 September, 2008) and nearly 40 people attended. Reindeer herders, scientists, students, administrators and politicians were all in attendance. So far, EALÁT-Information workshops have been held in Norway and Finland which will be the focus of this chapter.

Reindeer and people have a connection that is thousands of years old in Fennoscandia. Archaeological sources such as hunting pits, stone carvings and settlement excavations speak to this connection. Stone carvings at the coast of Northern Norway also connect reindeer and humans more than 6.000 years ago. First by hunting, then domestication and herding. In 98 AD, the Roman historian Tacitus wrote about a people – Fenni – in Thule, who

used fur clothes, hunted reindeer and travelled with skis. In 870 AD King Alfred the Great of England received the chief Ottar who lived in present day Norway, who, wrote Alfred, kept a herd of 600 «tame» reindeer and 6 decoy reindeer for hunting wild reindeer which he had received in tribute from the Sámi.

The traditional areas of Sámi reindeer husbandry were divided between the borders of four nation states – Norway, Sweden, Finland and Russia in the 19th and 20th Centuries, the



EALÁT-Information workshop in Inari, Finland. SDM.



Reindeer herding in Kautokeino, Báđášjohka. JMG.

effect of which has meant changes in traditional herding practices. The traditional unit of organisation in Sámi reindeer husbandry is the «siida». This is basically a grouping of one or more families, where the practical work related to reindeer herding is shared. Today, reindeer husbandry in the Sámi region is characterised by relatively large herds and a high degree of mechanisation in all regions. Reindeer are primarily used for meat production, while hides, bones and antlers are important for clothing and handicrafts. Recruitment to reindeer husbandry has been limited in Norway by various factors, a lack of available pastures among them. All animals in the Sámi area excluding Russia are privately owned, although many aspects of herding are practiced collectively in the siida system.

Reindeer husbandry in Norway today involves nearly 3,000 people and about 240,000 domesticated reindeer, the majority of which are in the county of Finnmark. Reindeer are herded over an area of approximately 146 thousand km² in the counties of Finnmark, Troms, Nordland, North-Trøndelag, South-Trøndelag and Hedmark. According to Norwegian law, only Sámi people may herd reindeer in these areas. There are also some minor concession areas outside the Sámi herding area, where Norwegians also herd reindeer. The total pastures are equivalent to 40 % of the mainland area of Norway. Reindeer husbandry is administered by the Reindeer Husbandry Administration, a State body which is beneath the Norwegian Ministry of Agriculture.

In Finland, reindeer husbandry is not ethnically restricted to Sámi and the livelihood

is open to any citizen of the European Union. In total there are approximately 5,600 people connected to reindeer husbandry, the vast majority of whom are Finns. The reindeer husbandry area in Finland lies in the most northerly parts of the country and covers almost the entire area of the Province of Lapland and part of the Province of Oulu. The reindeer husbandry area covers 114,000 km², which is 36 % of the surface area of Finland. The northernmost part of the Finnish reindeer husbandry region is classified as the Sámi reindeer herding area, where Sámi reindeer husbandry is concentrated. Reindeer herding is administered by a cooperative system of which all owners of reindeer are members. Each cooperative represents an economic unit and



Traditional Sámi halter for reindeer. MAS.

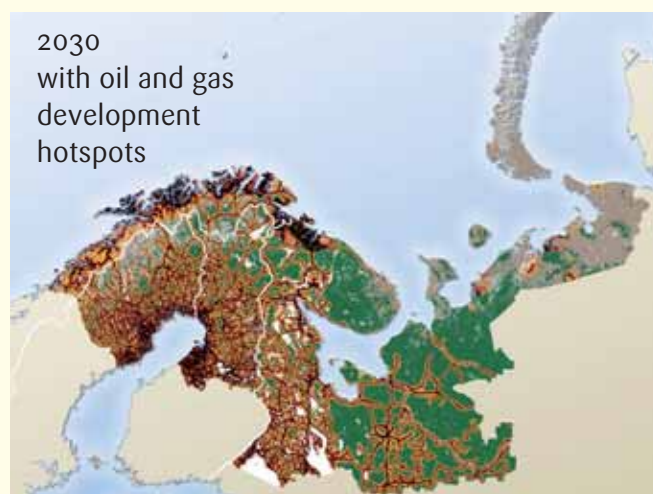
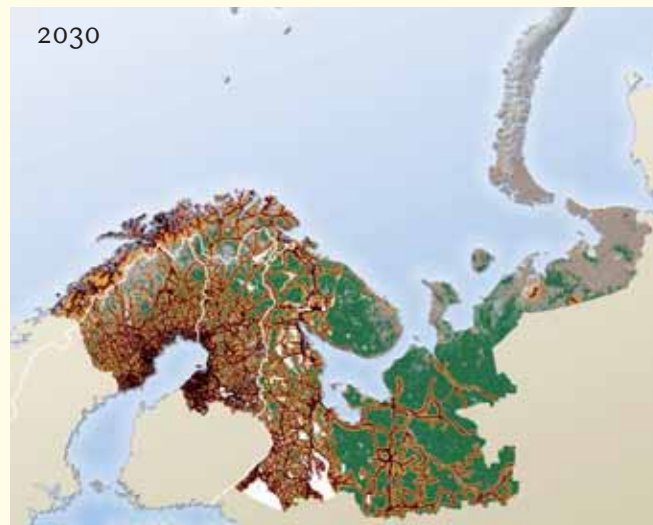
Globio scenarios

Development scenarios for the Barents Region, assuming varying levels of petroleum development towards 2030. In 2000, 15 % of the region was significantly disturbed as grazing land for reindeer. With continued infrastructure development using current growth rates, this figure will increase to 25 % by 2030 (figure 6a), or with 30 % assuming increased petroleum development (figure 6b).

Scenario b) means that an additional 21.000 km² will be significantly reduced in value as reindeer grazing grounds compared to scenario a).

Source:

Vistnes et al 2009



a geographical area. There are 56 such cooperatives in Finland today. The current number of reindeer in Finland is about 200,000, which are all privately owned. An individual can own no more than between 3–500 reindeer depending on location⁵.

Climate Change and Variability

Temperature projections for Kautokeino signal a dramatic change in mean seasonal temperatures over the next 100 years. Data for Kautokeino comes from a weather station just outside the village. The mean seasonal temperatures for Kautokeino (1961–1990) were winter (-16.0°C), spring (-5.2°C) summer ($+10.0^{\circ}\text{C}$) and autumn (-1.0°C)⁶. By 2070–2099, winter and spring temperatures are projected to have risen to -5.2°C and $+1.5^{\circ}\text{C}$ respectively. Summer and autumn temperatures are projected to have risen to 14.6°C and $+3.8^{\circ}\text{C}$. In addition, by the end of the century, it is projected that there will be a 10% increase in precipitation in the Kautokeino area. This is not surprising given that the projected winter and spring temperatures in Kautokeino will closely track current mean winter and spring average temperatures in Hammerfest, on the Norwegian coast. This represents a significant shift and it is likely that rapid and variable fluctuation between freezing and thawing will increase with these ranges. If so, it will certainly provide considerable challenges to the practice of reindeer husbandry, particularly on the winter pastures.

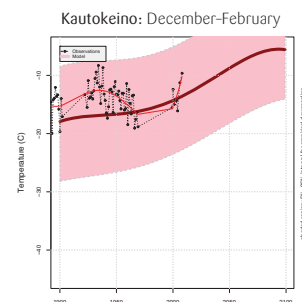
Climate change was a concern for Sámi reindeer herders participation in the workshops. Herders worried that temperature variability coupled with loss of pastures could



Observing reindeer in the corral. PB.

reduce their ability to respond to changing conditions. Several herders are noticing changes that reflect weather and climate variability:

The areas of the far North are historical areas for settlement of indigenous peoples that have developed and adapted their cultures and livelihoods to these marginal Arctic areas. There is a great danger that climate change in the Arctic and increasing economic activity in the North will especially impact indigenous peoples that carry out their nature- and resource-dependent livelihood here.



⁵ Paliskuntain Yhdistys
⁶ Benestad, 2008

Those who are most dependent on nature will also be most vulnerable.

*Berit Oskal Eira, Reindeer Herder and
(former) Norwegian Vice Minister*

Reindeer herding is probably the industry where the weather is discussed the most. When a reindeer herding Sámi speaks of the weather, he talks about what consequences the weather will bring, while simultaneously connecting the weather with the reindeer. [...] It is a fact that cold weather in winter with strong winds packs the snow, and this snow reduces the pastures because the reindeer can't access the food. But wind isn't always harmful to reindeer husbandry. Strong wind during mild weather brings the opposite effect; strong wind softens the snow so that the rein-

deer can access the food. If we now look at this last year and the weather in Northern Norway throughout the year, the mild weather came by the end of April causing the snow to become wet...By May the mild weather returned, and then came summer which was very rainy. The snow came late in the autumn which had consequences for reindeer husbandry in these areas. Now the winter has come, and with it also the cold, simultaneously a rather large amount of snow came that also affected the reindeer pastures. In addition ice-layers have been formed in the snow. We have noticed that the mainstream society around reindeer husbandry does not know our traditional way of thinking, values, language and ways of working. For the reindeer herding Sámi the reindeer is a free animal, it



Herding in springtime can be hazardous. Snowmobile track on a thawing river. SDM.



Students from the Reindeer Herding Secondary School of Kautokeino, driving reindeer during the Indigenous Peoples' International Polar Year opening, February 2007. MAS.

wanders without being attached to anything. Reindeer is the animal that naturally belongs to those areas where reindeer herding is practiced.

Nils Henrik Sara, Reindeer Herder, President of Norwegian Sámi Reindeer Herders' Association


I am not too concerned about climate change if it is due to nature itself. But if it is due to people, that people have been destroying nature, then I am worried.

*Karen Anna Logje Gaup,
Reindeer Herder*

In my summer pasture areas, there is a big glacier. This glacier divides the area into two parts. Today reindeer can cross the glacier. But the recent years, the glacier has shrunk so much that it has become difficult for reindeer to cross it. I fear that when the glacier disappears, my summer pasture area will be divided into two separate parts.

Nils Henrik Sara

We have some knowledge about how to live in a changing environment. The term «stability» is a foreign word in our language. Our

A photograph of a traditional Sámi lavvu tent, a conical structure made of wooden poles and animal skin, set in a snowy, forested landscape. The tent is partially obscured by snow-covered evergreen trees. The sky is a pale, hazy blue, and a small, bright light source, possibly the sun or moon, is visible in the background. The overall scene is serene and wintry.

«We have some knowledge
about how to live in a changing
environment.»

The Sámi lavvu – a traditional tent designed for life in the North. PB.

search for adaptation strategies is therefore not connected to «stability» in any form, but is instead focused on constant adaptation to changing conditions.

Johan Mathis Turi

We usually check the snow with a stick, if it goes easily through [the snow] it's usually good. But here there is a couple of centimetres of ice-cover in between. But this one is quite high up, so the reindeer will manage to punch through it. This year it is not so bad, quite good pastures. The bottom part here is searjáš [a granular snow that resembles sugar], it is quite soft.

*Isak Mathis O. Eira, Senior Reindeer Herder,
explaining snow dynamics in the field,
Kautokeino 2009.*

Reindeer herders can also have a lot of knowledge about weather, not just snow,

I don't forecast the weather. I use information from the reindeer, the moon and the sea. I compare these factors, and make my own system to explain the weather. I have tried to ask for help from those who know mathematics better than me, but nobody seems to understand my explanations on how to see what kind of weather is coming.

The late Mathis Aslaksen Sara, Reindeer Herder.

Loss of Pastures

Reindeer herding represents a highly extensive form of land use. Loss of pastures represents a major challenge to the maintenance of Sámi



Snowcover and reindeer pastures. SDM.

reindeer husbandry. Infrastructural development in this region has been relatively severe compared to other regions. Pasture losses are caused by a variety of activities, such as the construction of buildings, hydro-electricity facilities, pipelines, roads, other infrastructure. On the Norwegian side this development has been for most part in the coastal areas, while in Finland forestry has also impacted reindeer herding. Research suggests that the progressive and effectively irreversible loss of uncultivated lands which reindeer use as pasture is probably the greatest single threat to reindeer husbandry in the region today. Future development scenarios have estimated further encroachment on reindeer pastures in these areas. Reindeer herders at both EALÁT-Information



«We have no choice but to
adapt to the mainstream society,
and if they don't accept us,
we will be pushed aside.»

Reindeer train, Kautokeino, Norway. OIE.

workshops in the Sámi area were concerned about the loss of grazing lands to industrial activities and tourism.

These days, encroachment is our biggest problem. They are building a little bit everywhere, and in a manner of speaking are ripping the reindeer pastures apart as they go. We have no choice but to adapt to the mainstream society, and if they don't accept us, we will be pushed aside.

Nils Henrik Sara

It was said that the new development (StatoilHydro's LNG plant in Hammerfest) in this area would have positive effects for the local community and... many people saw it as a positive development. We reindeer herders were concerned about how this development would affect our future livelihoods – we felt that the promise of positive effects for the local community put a strong pressure on us. It became difficult for us to show the impacts that this development would have on our reindeer herding, and when compared with the large oil and gas installations, our small industry would seem like a drop in the ocean.

But if we were to look at this from another angle, the angle that the value of our husbandry is not measured in dollars but instead connected to the areas that we use...

In this way we could show our strength, that our industry is based on the access and use of these areas. Because of this the situation for us reindeer herders grew very difficult in terms of showing the consequences for our industry.

We were sort of forgotten in the whole process and our perspectives were not focussed on. Because the LNG-plant itself was not placed directly on reindeer pastures, we were not fully included in the total process of regulation. And with this start that we got, when we were not focussed on, we were continuously lagging behind in the process, not able to follow this up properly. During the process that led up to the decision to initiate the entire development, there was not enough knowledge about the situation, knowledge that we have today. Due to the development we have seen an unexpected explosion in human activities. We have much more competition for our pastures now. There has been introduced a lot of other development projects that will impact our pastures. When you have this kind of major industrial development in Hammerfest, it makes the area around Hammerfest very attractive for other types of development. Also the society of Hammerfest is rapidly expanding because of the development.

Now there is talk about several possible projects, and planning has begun. This includes petroleum development, new power lines, windmills, infrastructure development and



Swimming from the traditional summer pasture of the island Arnøya to the mainland of Norway. PB.

«We were sort of forgotten in the whole process and our perspectives were not focussed on.»



The StatoilHydro LNG plant «Snøhvit», Hammerfest. SDM.



Flaring. SDM.

roads. These are heavy investments driven by independent and influential economic sources, also in part independent of Statoil. We also see increasing human activities in our pasture areas in terms of outdoor leisure activities. It cannot be right that one side gets the benefits of development, while the other only get the negatives. We had no idea about the scale of the industrial development when it started, and nor did people in the town either. It was impossible to make a picture of it before it began and we see it all just now, and only now we see what it has meant and what it can come to mean to us. We have to try to adapt

to this, as long as we can. But to do this, also developers, local and national authorities and mainstream society must be willing to contribute. Anyway, it is absolutely clear that our pastures are being reduced. And therefore we need to get in very early as a participating partner in development projects, as early as possible, to try to have a reindeer herder's voice in the early planning process

*Aslak Ante M.J. Sara, Reindeer Herder,
Head of the Fálá reindeer herding district,
which includes the city of Hammerfest.*

Our main challenge is preserving pastures. The main threat in our area is the entry of mining companies, after the Finnmark Act came into force last summer...They say that they have found deposits, and that now the question is no longer «if extraction will take place». Extraction will take place and reindeer husbandry must make room for it. We see that the ore goes through all our pastures and migration routes. And we already have scarce pastures here; there is not enough room for everybody on the winter pastures. If the winter pastures and migration routes are lost, people will have to quit working with reindeer, as reindeer husbandry is not possible without winter pastures.

Máret Sárá, Karasjok.

With increased development comes other land uses such as demands for recreation:

Of course tourism is tourism and it is important, but the reindeer pastures are decreasing. One person coming to us here in Eanodat



Senior reindeer herder Aslak M. Utsi teaching traditional slaughtering techniques to Maren Anna Sara, Maren Risten Sara, Kari Mákreda Utsi and Ellen Sara Eira Buljo. SDM.

(Enontekio) isn't much, but a thousand people coming is another matter. They will use the same amount of area as 1,000 reindeer.

J. Antti Magga, Reindeer Herder.

Traditional knowledge and adaptation

Traditional knowledge is not utilised much. The primary reasons for this are threefold; accessibility, status and power relations. It has not been easy to obtain the knowledge because it has been accessible only to a limited degree outside the livelihood. Further, the knowledge has not been appreciated by different entities, among them the reindeer husbandry administration.

Professor and EALÁT-Research Project Leader

Ole-Henrik Magga

The traditional knowledge of reindeer herders takes many forms and Sámi reindeer husbandry is no exception. Much of the discussions in the EALÁT Information workshops revolved around herd structure, the importance of castration for designing a herd and the importance of language. Herders commented at the workshop in Finland regarding management and legislation, that Sámi reindeer husbandry has been assumed to be similar to Finnish, whereby conditions stay stable year after year as reindeer are fed artificial feed. During the workshop in Finland, herders also stressed that they wanted more self governance regarding their traditional reindeer herding activities. Traditional knowledge and the future of reindeer husbandry were also topics of discussion.

In a Sámi reindeer herd, there have always



Traditional knowledge: Sámi reindeer herders use over 200 expressions for snow and snowchange. SDM.



Layers in the snow cover, Kautokeino, February 2009. PB.

been a lot of males. They are strong and they are able to dig snow. They survive as long as the bottom is not frozen. Hard snow is not a deterrent to them and neither is an ice layer on top of the snow a problem.

*J. Antti Magga,
Reindeer Herder*

Herders in both Norway and Finland noted that as long as they have autonomy regarding for instance herd structure, climate change will pose less of a threat.

If we were not allowed to castrate our male reindeer, Sámi reindeer husbandry would end. Such a ban would end the culture of Sámi reindeer husbandry. [...] Even if we don't need the castrated males for transportation, they are important to the herd. [...] We need the males and we need non-productive females – not only the productive females because we need animals that can dig through the snow. [...] The Sámi way is that we are always able to cope if we choose our own alternatives. [...] I think that the first thing that should be done if we are to recognise the importance of



Sámi student Elen Anne Sara and senior reindeer herder Antti-Oula Juuso. PB.

traditional reindeer husbandry is that the government should support it, and not just subsidise the construction of fences and artificial feed.

J. Antti Magga

Sometimes castrated male reindeer still have velvet on their antlers during winter when they are sufficiently «hard» castrated in



EALÁT workshop in progress, Kautokeino, February 2007. MAS.



Workshop participants in Inari, Finland. SDM.



Hendá Smuk contributing to the EALÁT workshop in Kautokeino, February 2007. MAS.



From the opening of the Indigenous Peoples' International Polar Year, Kautokeino 14 February 2007. MAS.

the fall. In Sámi we call these reindeer stohkke nameoaivi, but sometimes old castrated males behave the same way as non-castrated males, they do not have not velvet on their antlers in winter. We prefer castrated reindeer without velvet on their antlers. If I castrate a male smartly, and don't hold on too long when closing the canals to the testes, it is possible that I can get a reindeer without velvet on the antlers all year round. This makes the animal stronger. In Sámi we call these reindeer ruovdečáluoavi.

Johan Mathis Turi

In late winter the females are weakest and pregnant females are not strong enough to dig through the snow but the males are. We need males to dig through the snow if it is hard. [...] We spoke a little about «close herding» which in the Sámi language is called guođoheapmi. When there is little snow we try to keep the

reindeer in a place where we cannot take them later in the year. That is the idea of close herding.

J. Antti Magga

Even if the price of fuel increases, we can't quit reindeer husbandry.

Piera Matti Ruotsala, Reindeer Herder, Finland

It is more convenient to talk in the Sámi language. It is easier. I can speak such Finnish that I learned in school, but not very well. It is a question of mother tongue[...] For me, the use of Sámi is easier regardless of the issue... every issue...

J. Antti Magga

When we want to talk about reindeer issues, we prefer Sámi [language].

Antti-Oula Juuso



Observing the herd. April, 2007. Kautokeino. SDM.

When we see hair breakage, then we know that the animal is in good shape. An animal with hair breakage around the neck and to the shoulders is a good animal.

Antti Oula Juuso

Two to three year old males without antlers with broken hair around their neck are the best ones. It is because of their digging and grazing through hard snow. Their hairs are not broken due to poor physical condition, but because they have the energy to graze.

J. Antti Magga

Reindeer basically have a more or less rigid pattern of activity every day. It moves when its need for food is satisfied, and it calms down when resting. This is what in Northern Sámi language we call «veaigi» and «liivat». Both grazing-time, resting-time and synchronising can change with the weather conditions, with the reindeer's condition, and with the season, in addition to that which concerns the pastures directly. Grazing-time and resting-time can easily be manipulated. The manipulation of grazing-time and resting-time happens often in practical life, for instance by migration over long distances or when the reindeer is put into corrals. Sometimes it is also beneficial to break the synchronisation of grazing and resting times to calm the herd down. The herd is like a living organism that is bound together with invisible ties. When some animals begin to move this can, under specific circumstances, be a signal that also puts all the others into motion. This often happens in the transition between winter and spring, when

the herd wants to move because of natural causes.

Johan Mathis Turi

Everybody knows that traditional reindeer husbandry is based on the use of different seasonal pastures to utilize the pastures optimally. This is an adaptation that permits the making of a livelihood out of the marginal pastures that no one else can utilise. In principle, one could create the desired herd composition in order to adapt the herd to the specific conditions in which one is operating. However we could question who is deciding what in this pact of cooperation between reindeer and humans. The truth is rather that both are pieces in the play of nature. It is really the qualities of the pastures that define the limits for what kind of reindeer husbandry it is possible to establish in a given area, and as such also the limits within which humans can operate and manipulate. Today one does not have diversity in the herds that matches the diversity of different types of grazing land that one controls. The modern herd structure also makes the herds vulnerable to for example extreme snow conditions, as one does not have enough mature bulls that are capable of breaking through extreme snow covers. In addition, this structure has caused changes in the behaviour of the herds. The type of herd with only a few bulls moves around a lot and the pastures are utilised less efficiently than a herd with a traditional structure. This increase in mobility has caused herding practices today to be completely changed.

Johan Mathis Turi



Explaining and discussing the challenges of climate change for world reindeer husbandry. Honoured guests were HRH Crown Prince Haakon and HRH Crown Princess Mette Marit of Norway. Kautokeino, 2009. PB.



SDWG EALÁT-Information is reported to the Arctic Council. SAO-meeting in Kautokeino, November 2008. AX.

Dialogue, communication and capacity building

There have been a number of steps towards building capacity in the Sámi region. One such step is an initiative of the Association of World Reindeer Herders and the International Centre for Reindeer Husbandry project to establish a University of the Arctic Institute for Circumpolar Reindeer Husbandry (UArctic EALÁT Institute). It is envisaged that this project institute could contribute to a future Sámi University, the development of which has been approved by the Sámi Parliamentary Council.

The professional language of reindeer herding is Sámi, and even though the reindeer herding Sámi speak Norwegian fluently they can barely talk about reindeer and reindeer herding with those who do not speak Sámi. Researchers should therefore learn

about Sámi reindeer husbandry and its fundamental concepts if they are to do research in this field. [...] Luckily there are scientists that can tell us what the problems [related to climate change] might be. And when we cooperate with them, and they acknowledge traditional knowledge, together we can find solutions on how to manage in the future.

Nils Henrik Sara



EALÁT-Consortium meeting in Kautokeino, January 2009. PB.



School children welcoming participants to the Indigenous Peoples International Polar Opening, February 2007. KU.



EALÁT scientists and senior reindeer herder Isak Mathis O. Eira discussing snow change with HRH Crown Prince Haakon and HRH Crown Princess Mette Marit of Norway, February 2009, Kautokeino. MCE.



The Yamal tundra, September 2007. SDM.

YAMALO-NENETS AUTONOMOUS OKRUG, RUSSIA:

NADYM AND YAR-SALE

Authors: Anna Degteva, Ole Isak Eira, Leonid Khudi and Ellen Inga Turi

There have been two EALÁT Information seminars and workshops held in the Yamalo-Nenets Autonomous Okrug (YNAO). The first was held in Nadym (2–4 March, 2007) where a series of presentations were made by reindeer herders, scientists, students, politicians and administrators, with around 80 people in attendance. Reindeer herders from several regions of reindeer husbandry in Russia were

represented as well as herders and students from Norway, Finland and Sweden. The second workshop was held in Yar-Sale (22–23 September, 2007) which was followed by a one day workshop on the tundra as guests of Brigade 17 in the Yarsalinskoe reindeer herding enterprise, where discussions continued with reindeer herders.

Reindeer Husbandry in the Yamalo-Nenets Autonomous Okrug

The YNAO is a large area covering about



Reindeer herders' camp, Brigade 17 on the Yamal peninsula, September 2007. SDM.





Reindeer herding work, Brigade 8, during EALÁT field work, March 2007, in the Yarsalinskoe reindeer herding enterprise. EIT.

770,000 km² of tundra, permafrost, bog and water including the mouth of the Ob River, and the Yamal Peninsula. With just over ½ million inhabitants, the YNAO is actually one of the most «urban» regions of the Russian Arctic. At the same time, the region is one where reindeer husbandry is at its most vibrant. Approximately 14,000 indigenous people, primarily Nenets, practice traditional livelihoods in the YNAO, of which reindeer herding is at the core. In 2007 there were estimated to be over 600,000 reindeer in the region, representing nearly half the total number of domesticated reindeer in Russia, and ¼ of the world's population. The Yamal municipality, which includes the Yamal peninsula, is one of the most important region for reindeer husbandry (with almost half the reindeer of the YNAO). Around half the population of the municipality (over 5,000 people), practice nomadic reindeer husbandry.

Dominated by traditional subsistence livelihoods such as reindeer herding, hunting and fishing into a rapidly developing region of oil and gas extraction and a key strategic asset of the Russian national economy.⁷

There are different theories as to how and when reindeer husbandry was established in the region. The transition from reindeer hunting to reindeer husbandry varies, but domesticating small reindeer herds for transportation would appear to be the first stage⁸. The latest archaeological research in Yamal suggests that the inhabitation of the Yamal tundra only began when people learned how to use reindeer for transportation.⁹

Paleozoologists have discovered middens which are located on exactly the same migra-

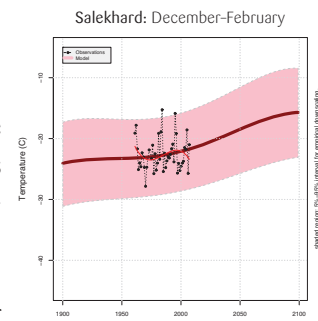


Reindeer are still important for transportation on Yamal. EIT.

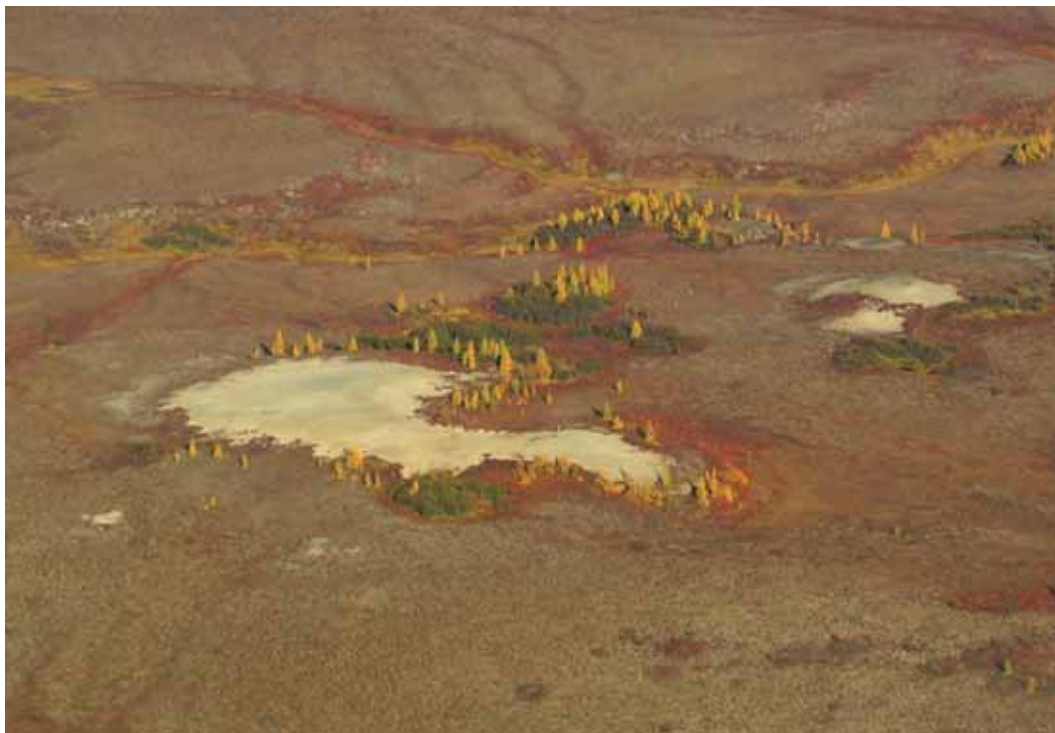
tion routes that are used by Nenets reindeer herders today. Today, it is hard to imagine the Yamal tundra without reindeer and their herders, and the Nenets represent one of the world's largest reindeer herding peoples. Khanty, Komi and Selkups are also engaged in reindeer husbandry in the region.

Climate Change and Variability

The climate in Salekhard, the capital of the YNAO is projected to shift dramatically this century. This is according to empirical statistical downscaling of temperature data sets from Salekhard, but is also supported by the observations of recent climate patterns by reindeer herders and local meteorologists who participated in the EALÁT workshops. The mean sea-



- 7 Forbes, 2009
- 8 Benestad, 2008
- 9 Federova, 2000



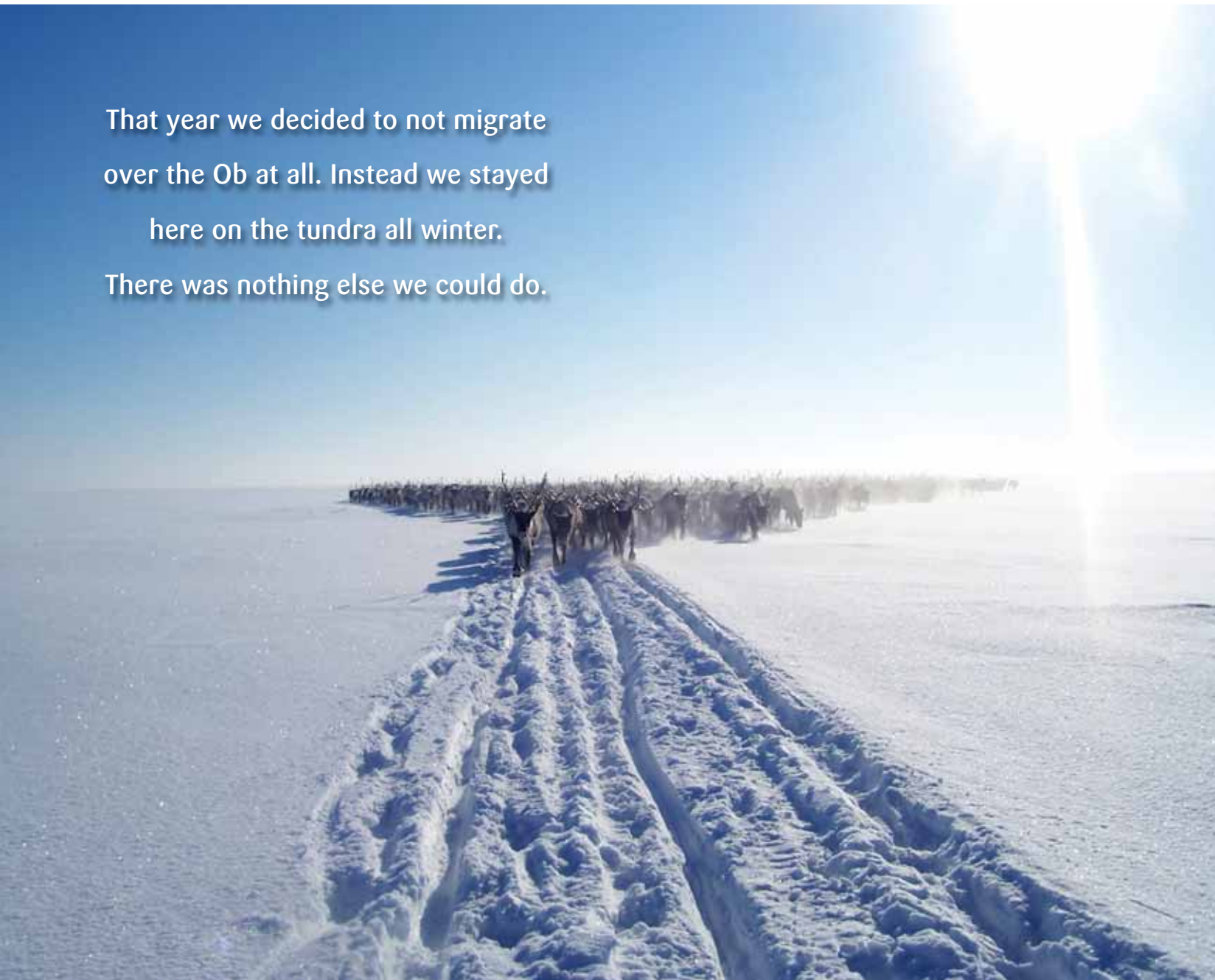
Permafrost, on the Yamal peninsula, September 2007. SDM.

sonal temperatures for Salekhard (1961-1990) were: -22.9°C (winter), -8.9°C (spring), $+11.1^{\circ}\text{C}$ (summer) and -4.9°C (autumn). By 2070-2099, winter and spring temperatures are projected to have risen to -15.9°C and -3.3°C respectively. Mean summer temperatures are projected to have risen to 14.5°C and autumn to 0.9°C . Therefore, by 2099, the range of mean autumn, winter and spring temperatures in Salekhard are projected to closely track the current mean seasonal temperatures of Kautokeino, and the risks associated with increased climate variability may be a challenge for reindeer herders. In summer, the average temperature in Salekhard is projected to be higher than the

present summer average temperature in Kautokeino.

An example of this increased variability was raised at the EALÁT workshop in Kautokeino, Norway: during the winter of 2003-2004; rain in January locked the pastures with ice in the winter grazing areas in the Nadym municipality. Some brigades responded to this by returning back towards their summer pastures, others responded by not migrating as deeply into the winter pastures as they normally would. This represents a systemic flexibility and a key adaptive strategy that may become more important should climate variability increase, as is projected¹⁰.

That year we decided to not migrate
over the Ob at all. Instead we stayed
here on the tundra all winter.
There was nothing else we could do.



Spring migration across the Ob Bay, during EALÁT field work, March 2007. EIT.



Brigade 17's pastures in the Yarsalinskoe reindeer herding enterprise, September 2007. SDM.

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 not to migrate over the Ob at all. Instead we stayed here on the tundra [on the Yamal peninsula] all winter. There was nothing else we could do.

Reindeer herder¹¹

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.

Reindeer Herder¹²

In Russia, we do not yet feel that climate changes hangs over reindeer husbandry like the sword of Damocles. But already the fact is that spring comes one month earlier and autumn come one month later. During winter it may rain several times and the pastures get covered with ice. This is a big problem for reindeer herders. Large problems for migrations of reindeer from pastures to pastures appear too. This raises the question of adaptation for both animals and people.

*EALÁT-Information seminar participant,
Nadym*

Loss of Pastures

Within the Yamal region lie nearly $\frac{3}{4}$ of Russia's and over 20% of the world's known gas reserves, and the Yamal peninsula is the focus of the region's future energy megaprojects. These new sources of energy in areas such as the Bovanenkovo field lie beneath reindeer pastures, while their extraction involve an extensive network of roads, pipelines and railroads.

For reindeer herders, pastures are a key resource, and so their loss would represent a great challenge for reindeer and the herders that depend on them. Development in the

¹¹ Nenets reindeer herder quoted in Turi 2008: 62

¹² Nenets reindeer herder quoted in Turi 2008: 63



Migration in the Bovanenkovo area with Brigade 4, in the Yarsalinskoe reindeer herding enterprise, during EALÁT field work, July 2008. AD.

But what more can we lose
if we lose our reindeer?



Sergey Serotetto working with his herd, March 2007. EIT.

South of the region has already meant a considerable loss of reindeer pastures. However, the wider effects of development are at least as important. Fishing lakes can be damaged and fish are an essential part of the Nenets summer diet. Critical pastures may be lost, road and pipelines can dissect migration routes.

Reindeer herders have also complained that construction materials have been left on tundra, materials that can be hazardous to reindeer. With this development increased poaching of animals, birds, fish and reindeer is a risk, especially as new roads open up the tundra.

The Russian system of managing reindeer husbandry has many drawbacks. Let us take Yamal as an example. The first priority is given to the oil and gas sector. Railroads and gas pipelines will come to Yamal. If a reindeer herder loses his reindeer, he will lose everything he has. For him reindeer are transport, dwelling and food. If the pastures are destroyed, the reindeer, fish and birds will die. And they are the basis of life, not only for the Nenets but for everyone else who lives in the North... we don't have to delay gas exploitation, but it must be done in a clever way in order not to damage the people who live from reindeer herding. I do not say that gas exploration must be prohibited. But what more can we lose if we lose our reindeer?

Sergey Serotetto, Reindeer Herder, Nadym

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 ... Pastures are our

greatest resource during times of crisis. We must therefore try our best to prevent the loss of pastures.

Reindeer herder¹³

Concerning oil and gas, academician Alferov once was asked how long oil and gas would last as an energy resource. His answer was about 70 years. If we hold our positions in the tundra now, the Nenets with his reindeer will reign the tundra after these 70 years have passed. And all these iron pieces will disappear in the earth.

Former Reindeer Herder, EALÁT-Information seminar participant, Nadym

¹³ Nenets reindeer herder, quoted in Turi 2008: 62



EIT.

«The key issue is
to which extent they
show wisdom.»



Reindeer herding in Yamal Brigade 17, in the Yarsalinskoe reindeer herding enterprise. SDM.

Reindeer herders have controlled vast areas of the Arctic for centuries and only recently has the petroleum sector become interested in these regions.[...] oil and gas has appeared and it will disappear, but the reindeer will be there forever. Take care of our reindeer!

*Dmitry Khorolya, President,
Association of World Reindeer Herders*

How is oil and gas going to influence the environment and traditional economic activities? Here we choose the golden middle road. It is very easy to declare each other to be enemies of the State. But there exists also another and more civilised way. This is the track of dialogue and cooperation and mutual problem solving by both the protagonists of traditional economy and the industrial sector. The first task is to minimise the impact on the natural environment as much as possible. The second task is that this or that development shall not make the situation for the other part worse. Last but not least everything depends on the concrete leadership of an enterprise and the indigenous peoples' communities. The key issue is to which extent they show wisdom. This will be decisive for relations between the workers in the industrial sector and in the primary sector. Cooperation, mutual understanding, complementary behaviour and consultation with each other is the only and the best way. The alternative is to declare war, but this has never brought any good to anyone.

*Sergey Kharuchi, President of RAIPON and
Chair of YNAO Duma.*

Traditional Knowledge and Adaptation

As with other areas of traditional reindeer husbandry, it is the family that binds Nenets reindeer husbandry together. Nenets reindeer husbandry also depends on reindeer for transportation, with some Nenets migrating as much as 1.000 km annually with limited use of snowmobiles or ATV's. As climate is predicted to increase in variability, the traditional knowledge needed to structure the herd is of increasing importance.



Family-based reindeer husbandry. Ilya and Nina Khudi, Brigade 4, in the Yarsalinskoe reindeer herding enterprise, during EALÁT field work, July 2008. AD.



Gathering transportation reindeer, Brigade 17 in the Yarsalinskoe reindeer herding enterprise, September 2007. PB.

The reindeer herders of Yamal have preserved their ancestor's knowledge and are sharing them with others. Reindeer herders' survival experiences are being used by those who work with oil and gas, construction companies, meteorologists, pilots and road builders when they make use of these territories for the exploitation of oil and gas. Because of traditional knowledge the reindeer herders of Yamal are able to do their work even when there is a critical shortage of pastures and new oil and gas exploration is taking place. As long as there exists reindeer and reindeer herders, the image of Yamal will be associated with the image of a reindeer herding region. Thanks to its reindeer herders so much attention is paid to Yamal. The traditional way of living of the

reindeer herders of Yamal is decisive for maintaining reindeer husbandry in the Arctic.

Leonid Khudi, President of the Reindeer Herders Union of Yamal, EALÁT coordinator

In Russia during its long history of practicing scientific selection, not a single breed of reindeer has been created by scientific selection. People's [reindeer herders] selection has created five [breeds].

Dr. Alexander Yuzhakov, EALÁT Information seminar participant, Yar-Sale

The ratio of castrated males, non-castrated males, productive females and non productive females may all have increased significance. According to reindeer herders, castrated males



Raisa Serotetto, Brigade 8 of the Yarsalinskoe reindeer herding enterprise, March 2007. EIT.



The male herd of Brigade 17 in the Yarsalinskoe reindeer herding enterprise. SDM.

have a calming influence on a herd which results in a lower energy expenditure for the reindeer and the herders. The structuring of a reindeer herd to reduce vulnerability could be seen as a long term project also dependent upon economy, institutional constraints and pasture availability.

Reindeer castration is a key element of traditional knowledge practiced by Nenets reindeer herders. In addition, castrated males generally live longer, up to 13 years, several years longer than their non castrated counterparts, meaning they also make good draught animals in later years.

Herd diversity is a key adaptation and survival strategy. For example, Nenets have many *avkas* (Nenets for tame reindeer) in the herd. Furthermore *Khaptarkas* (non-productive females) are also used as draught animals. Non-productive females are considered to strengthen herd structure, as they are strong enough to persevere during the most difficult migration period, namely spring.

«Avkas» are very important, since they facilitate managing the herd. They obey people and lead the rest of the herd...[they] respond to human call and can be harnessed in case of emergency.

Brigadier Nyadma Khudi, Brigade 4, Reindeer Herder

That's why there exist three resources in the reindeer husbandry: There are the reindeer themselves, the reindeer pastures and the reindeer herders. As Nenets' experience has shown a herder can lose nearly all his reindeer. But he can restore the population if he has



Johan Mathis Turi on the right, participating in the Reindeer Herders' Day, Nadym. SDM.

pastures and other people around who can help. This is a renewable resource... reindeer husbandry will die, if there are no reindeer herders with traditional knowledge left. It is enough to destroy one generation! The reindeer husbandry of Yamal is still inherited from generation to generation. If one generation is lost, the ethnic basis of reindeer husbandry will be dead. Well, another type of reindeer husbandry may come. But it will be a different reindeer husbandry. And the reindeer husbandry which we have now will be lost. That's why it is of the utmost importance to take this



Traditional knowledge of Nenets herders encompasses virtually every aspect of life on the tundra. Raw meat is an essential part of the Nenets diet. EALÁT field work, 2007. EIT.

spiritual and human resource into consideration in all our projects and plans.

Dr Alexander Yuzhakov

...But it is possible to solve this problem. It is necessary to come to an understanding between private reindeer herders and state officials. If not, the reindeer husbandry will be finished. Why did the reindeer husbandry at Yamal survive? Due to private reindeer herding. Private reindeer herders have a different attitude to reindeer.

Mikhail Yar, Reindeer Herder, Nadym

A while ago, I read in a magazine that reindeer herders are not civilized. This statement was so provoking to me that I spent an entire week on the tundra, with our herd, simply thinking about this[...] Then, a while later, we had some visitors from the city in our

chum. It was clear to me that they could not take care of themselves out here, they did not behave according to our traditions in the chum, they asked many strange questions – of which some were quite impolite [...] Now when I come from the tundra and go into Salekhard, I can understand that some may see me as non-civilised. But out here, it was they who were uncivilised. So then I realised that there are actually two types of civilisation: The first type is what I call «technological civilisations». It is the kind of civilisation that breaks down if the electricity and water supply fails. The other kind of civilization is what I call «ecological civilisations». This is the kind of civilization, that is based on nature, like reindeer herding.

*Nikolay Laptander, Reindeer Herder,
Salekhard*



Sámi student Rávdná Biret Márjá Eira with Nenets youth. SDM.



Nenets and Sámi reindeer herders exchanging knowledge, March 2007. SDM.

Our intentions are the same,
that is to solve the problems.



Herders in Brigade 17, in the Yarsalinskoe reindeer herding enterprise, during the EALÁT-Information workshop, September 2007. PB.

Dialogue, communication and capacity building

Seminar participants and reindeer herders on the tundra agreed that there were challenges to be faced over the coming decades in Yamal related to the complex relationships between traditional livelihoods and the coming wave of petroleum development. However there was a clear desire for increased dialogue between industry and reindeer herders, as well as local capacity building that would ensure that the benefits of industrial development would also be felt by those who chose to maintain their traditional livelihoods. A concrete recommendation from the workshop in Yar-Sale was to establish a research institute in Yamal

with a focus on traditional knowledge, reindeer herding and other indigenous livelihoods.

Here the world's most powerful energy complex and large scale traditional reindeer herding do coexist... That's why [a proposed research institute] must be called the Institute for Traditional Economy of the Indigenous Peoples of the North. Why it shall be situated in Salekhard is clear. This is correct because Yamal today is the centre for maintaining traditional ways of living of the northern peoples. Absolutely everything is accumulated here. The indigenous ways of living and economic activities are best kept here.

Sergey Kharuchi



Nenets youth, Nadym, March 2007. RBME.



Brigade 8 of the Yarsalinskoe reindeer herding enterprise, during EALÁT field work, March 2007. EIT.

I have listened to this seminar. We have different problems! We are lagging behind you [Sámi reindeer husbandry]. It is difficult to believe that we can catch up with you. You have different problems. You have institutes, we do not have them. And here we fight for our existence.[...] But we have started to reach some joint conclusions. Our intentions are the same, that is to solve the problems.

Mikhail Yar

These types of activities (like oil and gas exploitation) are non-traditional and have had consequences, some of them negative ones. This due to the fact that reindeer herders' and local population's experiences were not taken into consideration. I hope that whatever will be done in the North and in the Arctic, the interests of indigenous peoples will be taken into

consideration, and that there will be as little impact as possible on the reindeer pastures and the indigenous peoples' traditional ways of living. I would like that oil and gas exploitation would be to the benefit of the peoples of the North. Oil and gas exploitation will come to the Yamal peninsula sooner or later anyway. My hope is that Sámi reindeer herders will make full use of the experiences of Russia and the Russian reindeer herders there, the reindeer herders from Yamal included. I say this not by chance. These are bitter experiences, which we have got by huge efforts and the loss of a lot of pastures and reindeer which it will not be possible to get back. That is why I would appreciate it very much if Sámi reindeer herders would take into consideration these experiences.

Leonid Khudi.

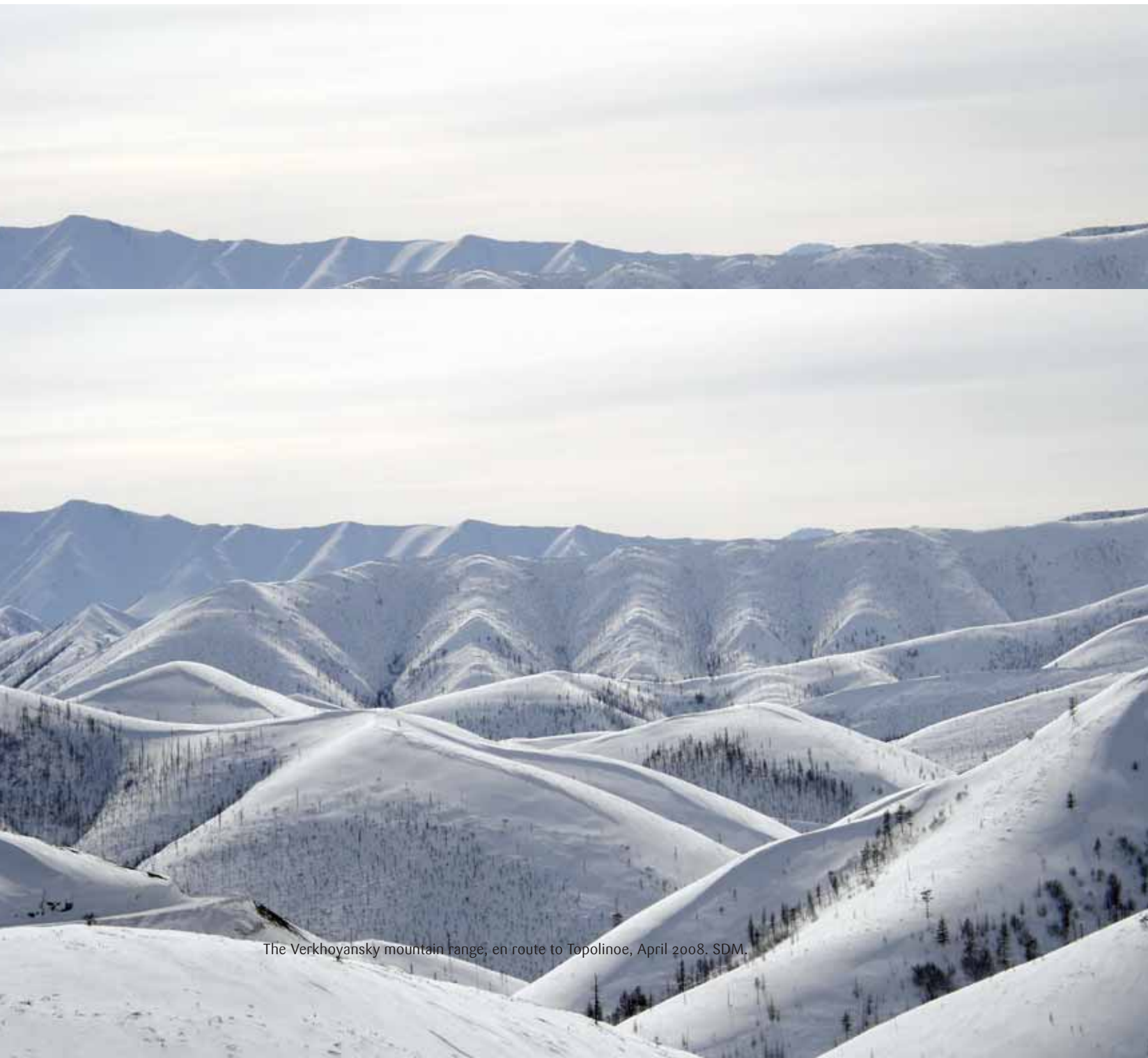




Ruslan Serotetto and Alexander Okotetto: Castration is a critical tool for structuring a herdEALÁT workshop, Brigade 17, Yamal peninsula, September 2007. SDM.



Five «khaptarkas» (non-productive female reindeer) harnessed for sledging. SDM.



The Verkhoyansky mountain range, en route to Topolinoe, April 2008. SDM.

SAKHA (YAKUTIA) REPUBLIC, RUSSIA:

TOPOLINOE AND KHATYSTYR

Authors: Mikhail Pogodaev, Kari Mákreä Utsi

On April 6-11th 2008 a community based EALÁT workshop was held in the Even reindeer herding village of Topolinoe. Reindeer herders from other areas of Sakha (Yakutia) – Momsky, Verkhoyansky, Oymyakonsky, and also from the Krasnoyarsky and Chita regions were present, including a representative of reindeer husbandry from Mongolia. The seminar was

attended by over 50 people, and additional interviews were held with reindeer herders over the subsequent days in and around Topolinoe.

On 23-26 September 2008 another community-based workshop was held in the Evenki village of Khatystyr in Southern Sakha. Khatystyr is a centre for taiga reindeer husbandry in the region. The workshop was attended by over 30 people, and also included a session in a taiga



Community based workshop in Topolinoe, April 2008. SDM.





Domesticated taiga reindeer in Bolshoi Njemnyr, Aldan, September 2008. AX.

reindeer herding brigade near the Bolshoi Njemnyr river.

Reindeer Husbandry in the Republic of Sakha (Yakutia)

The Republic of Sakha (Yakutia) is vast – covering over 3 million km², making up 1/5 of the Russia Federation, larger than France, Germany, Italy, Sweden, England, Finland and Austria combined. More than a half of the territory of the Sakha Republic is North of the Arctic circle. A region of this size is obviously made up of a variety of different bioregions from Arctic and forest tundra, to taiga and mountain-taiga. Only the middle part of the Republic no longer has reindeer husbandry.

The region is as sparsely populated as it is vast, with just under a million inhabitants of whom 6% are considered to be indigenous peoples. Five distinct peoples herd reindeer here, namely Even, Evenk, Chukchi, Yukagir and Dolgan. Reindeer husbandry is practiced in 23 uluses (regions) and covers a territory of 2,5 million km² which is about 83% of the total area of the Republic. Eveny reindeer husbandry is mostly practiced in the North-East of Sakha, but is also present in the North-West and South of the Republic. In the North West, reindeer husbandry is practiced by Dolgans and some Yakuts. In the North East, Yukagir and Chukchi herd reindeer, though they are numerically few. In the Southern mountain taiga regions, Evenki predominate. In 2008, the number of reindeer in the Republic was just over 180,000 with the largest number (20,245) being in the Tomponsky region, the site of the first EALAT Information workshop in Sakha. In the Aldan

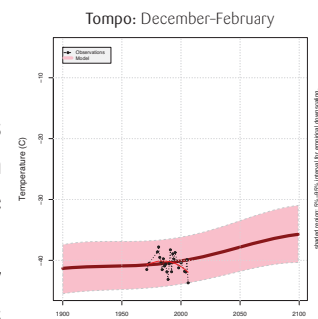
region the number of reindeer in 2008 was 11,555. In the Republic, there are currently 176 reindeer herding brigades employing 2,055 people, including brigadiers, reindeer herders, veterinarian reindeer herders and tent workers.¹⁴

There are basically three types of reindeer husbandry in Sakha (Yakutia) – tundra, mountain-taiga (Even) and taiga reindeer husbandry (Evenk). Taiga reindeer husbandry differs from tundra reindeer husbandry in terms of different nature conditions, shorter migrations (if at all), smaller herds and the use of reindeer primarily for transportation, among other things.

After the collapse of the Soviet Union and the transition to market economy, reindeer husbandry in Sakha (Yakutia) was hit especially hard. Large reductions in domesticated reindeer were experienced – in the 1990's alone, numbers were reduced by 2.5 times. With a curtailment in breeding work, a rapid increase of predator populations as controls were halted, a weakened economy and a reduction of subsidies, these were difficult times for reindeer herders and their families and there was a reduced recruitment to the livelihood. A moratorium on the slaughtering of reindeer was introduced which has only recently been lifted.

Climate Change and Variability

Climate data for Sakha (Yakutia) utilised in this book derives from Tompo, a weather station 18 km south of Topolinoe, site of one of the EALAT Information workshops in Sakha (Yakutia). Tompo temperature ranges are characterized by extremes. The mean seasonal temperatures for Tompo (1961–1990) were Winter (−40.6°C), Spring (−10.4°C) Summer (+13.1°C) and Autumn



14 Ministry of Agriculture of the Sakha (Yakutia) Republic, 2008.



Mikhail Pogodaev during a visit to a taiga herd, Khatystyr, February 2009. PB.

(-14.2°C)¹⁵. By 2070-2099, Winter and Spring temperatures are projected to have risen to -35.7°C and -7.7°C respectively. Summer and Autumn temperatures are projected to have risen to 15.2°C and -9.6°C. Even by 2099, Tompo will remain far colder in Winter and Spring than the other EALÁT workshop locations. Tompo is also projected to continue to be the warmest workshop site in its mean Summer temperatures. The coldest winter temperatures in places of human habitation are recorded in this region so starting from such a low base, climate change issues were not seen as a major challenge by workshop participants. In discussions on climate change, reindeer herders themselves made connections between warm and dry summers and tundra and taiga fires.

Given the cold continental climate, the challenges of winter temperature variability experienced by herders elsewhere was not a factor that was emphasized in the EALÁT workshops in Sakha. When asked if icing conditions had been experienced a herder responded:

No, never. There are just layers of early fallen snow. Sometime snow freezes dry as well, in this case it crystallizes which is good for reindeer.

Nikolay Osenin, reindeer herder from Topolinoe

That is not to say that it had never unexpectedly risen above 0°C, but it was characterised as a very rare event.

It has happened, a long time ago as I remember. Once during the reindeer herders celebration this time [February] it rained.



Angela Struchkova in the corral. KMU.

Maybe that was in 1988 or 1989 but...it was not raining for too long, maybe only for 20 minutes.

Nikolay Osenin

The speed of change in temperature was highlighted as significant for adaptation, in terms of reindeer selection.

If warming or cooling happens gradually, we don't think it will effect reindeer selection. But if it happens very quickly, of course, it may have an effect...There will be such ill-

nesses as pneumonia, like a man has in a sudden changing of weather.

Nikolay Osenin.

Herders did notice that the climate was warming, made visible by an increase in the growth of trees in the Tompo region.

Gradually the trees are becoming bigger... For us, of course, this is not good, because it will be easier to lose the reindeer. It will mean another method of pasturing.


Alexander Struchkov, reindeer herder from Topolinoe

The lack of concern about climate change was reflected by other herders, and a reindeer herder in the Tompo region also played down the threat posed by icing layers in the snow cover.

I think we should not be afraid of global warming, because it is so cold here. Other countries like Holland, Denmark and island states need to be more concerned about it... probably warming happens periodically every century. It was always like this. But now the effects of it are stronger, of course, because of industry – smog, factories and pollution [...]



Reindeer herder Mikhail P. Pogodaev in conversation, Reindeer herders' day in Topolinoe. Johan Mathis Turi and Ole Isak Eira in the background. PB.



It was always like this. But now
the effects of it are stronger...

Alexander Struchkov, reindeer herder from Topolinoe, April 2008. SDM.

Reindeer have not really suffered when there are bad icing conditions. If there is ice-covered snow, all the reindeer become emaciated, but most of them survive.

Alexander Struchkov

Concerning the taiga of Aldan, there appears to be a wide variation of climatic and topographic conditions even within the region.

The Aldan region has a uniquely variable nature and climate. I live by the Amga river. When it is -40°C in Aldan city, it can be -55°C in Amga. So nature differs considerably.

*Vasily Kornilov, Reindeer herder and brigadier,
Obschina «Kien-Uryakh», Khatystyr.*

In summer, mosquitoes and gadflies bother the reindeer, preventing them from grazing. Evenki reindeer herders have developed adaptation tools that are based on traditional knowledge. One method is to burn special types of moss together with reindeer droppings, to produce smoke that keeps insects away. This is also combined with building traditional wooden shelters for reindeer, to provide shade from the sun and to «contain» the produced smoke. Another method is to utilize areas with frost mounds, if available, which retains lower air temperatures and hence reduces the amount of insects. Summer grazing areas with frost mounds are valuable for taiga reindeer husbandry, as are the areas with existing traditional shelters.

Some taiga herders explained that snow depths in their winter pastures could reach 1,5 metres and even higher, making it difficult



Tree lichen, Bolshoi Njemnyr. AX.

for reindeer to reach the pastures below. Under such circumstances a type of lichen that grows on the trees can be essential.

It can save us if the snow conditions get really bad.

*Vasily Germogenof, reindeer herder and brigadier
of Brigade nr 6, «Khatystyr» Joint Stock Reindeer
Herding Company, in Bolshoi Njemnyr.*

Loss of Pastures

As for the taiga reindeer herding areas in the Aldan region, reindeer herders there face sep-



Gold mining dredge in Nizhny Kuranach, Aldan region, September 2008. AX.

arate challenges, including that of industrial development and loss of pastures. While Sakha has not yet experienced the development that has occurred in for instance the Yamal region or along the Norwegian coast, there are substantial development plans on the table. Aldan was a leading region for gold mining in the former Soviet Union. Now there are further plans for a number of mining projects, hydro-electric power dams and other infrastructure upgrades. Construction has also begun on the East-Siberian oil pipeline.

The challenges of development for reindeer husbandry seems to be recognized by the local authorities.

Because we have a relatively intensive industrial development in our region, we need to focus on and develop the traditional indigenous livelihoods and culture.

*Alexey Ivanov, Acting Head of Administration,
Aldan Ulus (Region).*

There is mining for gold and uranium, a new railroad and an oil pipeline that cuts through the pastures. We receive no compensation, but we lose pastures. The agricultural sector gets compensation, but not reindeer husbandry.

*Ivan Dormidontov, «Khatystyr» Joint Stock
Reindeer Herding Company.*

Our living conditions are bad, but if our lands disappear it will be even worse.

*Claudia Tikhonova, reindeer herder in
Obschina «Idjek», Khatystyr.*



Claudia Tikhonova, reindeer herder in Obschina «Idjek», speaking at the workshop in Khatystyr, September 2008. AX.

Taiga herders report that the development of the East-Siberian pipeline has had negative effects during the ongoing development phase. The Evenki herders visited in Bolshoi Njemnyr hunt wild reindeer for sustenance, using domesticated reindeer for transportation and milking. In discussions they reported a decline in the wild reindeer population locally, linked to disturbance from the development of the pipeline. There had been no previous contact between developers and the reindeer herders in the host brigade.



The underground East-Siberian oil pipeline construction site by Bolshoi Njemnyr. Anders Oskal with Evenki reindeer herders Prokopy Karamzin, Maria Borisova and Vice-President of Association of World Reindeer Herders Maria Pogodaeva, September 2008. MP.



Brigadier and reindeer herder Vasily Germogenof and Anders Oskal inside the pipeline. MP.



Site of an earlier taiga fire, Khatystyr region, February 2009. PB.

There were also worries in terms of possible pollution

The temperature variability could affect the pipeline. It stretches 300 km across the taiga. We are worried about accidents with the pipeline. If that happen it would be a catastrophe for us. The pipeline seems to have been poorly researched beforehand. It crosses rivers that could be polluted. That would be a disaster.

Vasily Kornilov.

Another threat to pastures as perceived by herders are tundra or taiga fires. Herders themselves were concerned with prospects of drier and warmer summers, expecting from

their own experience that this would increase the frequency of fires.

Here fires mainly occurs from lightning strikes. If the summer is dry and thundery, there are very many fires.

Mikhail P. Pogodaev, reindeer herder from Topolinoe.

Fire suppression programmes have in many cases been halted altogether.

During Soviet times we were given money to preserve pastures from fire. There was a special team of 12 firefighters. There was even a helicopter. Now there is nothing. Very much pastures have been lost.

Mikhail P. Pogodaev.



How can one person look
after all the reindeer? To do this it is
necessary to follow them constantly.

Alexander Struchkov working his herd, in Topolinoe, April 2008. SDM.



Traditional Knowledge and Adaptation

During the workshop in Topolinoe, time spent with the reindeer and knowledge of individual reindeer was stressed as being very important.

How can one person look after all the reindeer? To do this it is necessary to follow them constantly.

Nickolay Osenin

In any case the herders know their reindeer. Even if there are two thousand they must know them all.

Alexander Struchkov

A great deal of attention is also paid to selective reindeer breeding, and herders speak of three breeds of domesticated reindeer in the region: Evenki, Even and Chukchi (Khargin). Animal selection for optimal herd composition was a common theme of discussion during the workshop, including also cross-breeding of reindeer from other areas. In common with other herders, a great number of factors are taken into account when Evens choose animals.

We look at their body constitution. We look at the size of their chest and testicles [...], Reindeer with a wide chest are hardy





Alexander Struchkov and Motya Struchkova hosting EALÁT participants, April 2008. SDM.



Topolinoe, April 2008. SDM.

and strong for harnessing to sledges. Reindeer with small chests are very weak and get tired quickly.

Nickolay Osenin

The selection of animals for castration was highlighted as a critical element of herd composition, particularly in relation to the formation

of antlers. Colour was also highlighted as a criteria of reindeer selection.

We prefer and try to get reindeer of dark colour – reindeer of one colour – dark or grey. Usually reindeer of white or light colours are weak.

Nickolay Osenin

A feature of reindeer husbandry in the Tompo region that was striking to participating herders from the Sámi region was the large number of castrated males. The role of castrates in the herd was highlighted.

In order not to allow mating of weak reindeer we castrate all reindeer. [...] Even if it will not become «buur», a transport reindeer, it will go for meat, that's why we castrate them all.

Nickolay Osenin.

Castrated reindeers are calm and do not actively travel around, they mainly stay in one place and eat. For example, during the calving period, «buurs» dig snow and go away, and as females are with horns at this time, they come and eat in these places.

Nickolay Osenin

Earlier a sterile reindeer was specially kept in a herd, which was called «ketem». It was

considered that this reindeer «holds» a herd. If there is a such reindeer, it is usually harnessed on a sledge. Now sterile reindeer are mainly slaughtered.

Mikhail P. Pogodaev

A recurring theme for reindeer herders in this region was the relatively poor economic status of herders. The lack of economic opportunities was clearly connected to ownership issues in reindeer husbandry in the region.

Our biggest challenge is most likely the economy. We need to improve living conditions, to keep young people interested in working in reindeer husbandry.

Alexander Struchkov

All during Soviet times we have been living in such tents. We need to improve our living conditions, to build houses.

Mikhail P. Pogodaev



Reindeer racing on the Tompo river, April 2007. SDM.



...Every herder has to adapt himself, as you say
adaptation, everyone has their own method.



Maria Borisova preparing blood sausages. Traditional food culture of Evenki reindeer herders, by the Bolshoi Njemnyr river, September 2008. AX.

Private ownership of reindeer is limited in the Republic of Sakha (Yakutia), and this was something several herders said there is a need to change, for both herder and animal welfare.

If we bring in private reindeer ownership into reindeer husbandry, then it will be probably better... because you will look after your own reindeer more carefully.

Alexander Struchkov

I do believe that the future of reindeer husbandry in our region is private. Because if you own reindeer you have responsibility for

them and you will do your best to care of them when conditions change. Reindeer are from our ancestors who gave us traditional knowledge.

Vladimir Tuprin, Anabarsky region

Reindeer herders do not have the most important element – motivation. Because the most important factor in peoples' behaviour is motivation. The institution of private property is the basis of the market economy and is the base on which there should be a prospering economy.

Mikhail P. Pogodaev



Discussions with Evenki taiga reindeer herders in brigade number 6 of «Khatystyr» Joint Stock Reindeer Herding Company, Bolshoi Njemnyr, September 2008. GNN.



Driving reindeer on the Tompo river, Topolinoe, April 2008. KMU.

Private ownership was also related to geographical freedom of action and adaptation.

Yes, of course, reindeer herding will be much easier, because you pasture your reindeer yourself without waiting for anybody's orders. Whenever and however you can change the place of pasture, to move to other places.

Nickolay Osenin

Every herder has to adapt himself, as you say adaptation, everyone has their own method.

Alexander Struchkov

Things were different in Soviet times. Then there was planning. We did not need to know how. Others were thinking, telling us what to do.

Vasily Kornilov



Taiga reindeer herders in the Aldan region do what they can to adapt and minimize the impacts of development.

Now we try to use fences because of the impacts, especially in the autumn before winter comes. Every year we have to build 40 km of fences. Each brigade now has

responsibility to maintain 15 km of fences, while we also have to build more of them.

Ivan Dormidontov

We live in the traditional way. [...] We have to protect the traditional way of life. The new time now is not bad, with schools and all, but we will lose too much.

Claudia Tikhonova



We like EALÁT because
it is about life.

Claudia Tikhonova, reindeer herder
in Obschina «Idjek», Khatystyr.

Dialogue, communication and capacity building

One of the concrete outcomes of the workshops has been the establishment of an Information Centre for Taiga Reindeer Husbandry in Khatystyr. As a cooperation between the regional authorities of Aldan region, the Association of World Reindeer Herders and the International Centre for Reindeer Husbandry, the centre could become an arena for dialogue

and a major step for improving contact between authorities, developers and taiga reindeer herders. Comments by herders indicate the need for dialogue.

In our area they are planning a huge hydro-electric power dam. If they build it our lands will be under water. This means we have to move to the upper parts of the river. One summer, authorities came by helicopter to the



Community based workshop in Topolinoe, April 2008. PB.



Traditional method of herd control in the taiga, February 2009. PB.

river. They did not see any reindeer herders or reindeer there in summer, but we only use that area in wintertime. It is a very important area for us, both for reindeer grazing and hunting, and we also have fences there.

Claudia Tikhonova

[The oil pipeline] was implemented very quickly. They should have investigated river crossings and such things better beforehand.

Vasily Kornilov

The establishment of a centre for taiga reindeer husbandry can probably help us

handle megaprojects on mining of uranium, oil pipelines, railroad development and so on.

Claudia Tikhonova

Herders also communicated a need for information sharing.

We live very far apart, we need something to bind us together. We need information. Today we don't even have information about the reindeer husbandry here in Sakha. We need more contact.

Vasily Kornilov





The city of Anadyr, overlooking the ice road crossing Anadyr bay, Chukotka, February 2008. AX.

CHUKOTKA AUTONOMOUS OKRUG, RUSSIA;

ANADYR AND KANCHALAN

Authors: Anne-Maria Magga, Vladimir Etylin.

Between February 25 and March 1, 2008, there was a series of EALÁT Information workshops held in the Chukotka Autonomous Okrug. The first part was held in the regional capital of Anadyr, with over 50 participants including elders, herders, scientists, regional administrators and the local media. Workshop participants then travelled to the reindeer herding village of Kanchalan where discussions continued in the local school, with the additional participation of school teachers and pupils. The core group of workshop participants then travelled overland and were hosted by herders from Brigade 4 on the tundra and in the yaranga, the traditional tent of the Chukchi people.

Reindeer Husbandry in Chukotka

Chukotka is a large region covering 737,000 km² in Russia's Far East. It borders the Republic of Sakha (Yakutia) to the West, the Magadan Oblast to the South and the Bering Sea on its Eastern coast. Unconnected to the transportation infrastructure of Russia, for outsiders, it has long been synonymous with remoteness. Chukotka is mostly situated north of the tree line and much of the region is characterized by grasses and lichens, only occasionally interspersed with patches of

brush. The interior resembles a Sub-Arctic continental climate with fewer storms and less humidity than on the coast, but there are much colder winter temperatures, down to -50°C. Further North and East the Chukchi Peninsula is surrounded by ocean on three sides. This gives milder temperatures but unpredictable weather conditions, making it one of the most extreme areas for reindeer husbandry in Russia.

The region fell into severe turmoil after the fall of the Soviet Union, which saw a rapid decrease in population as Russian and other settlers left Chukotka due to the economic crisis. Currently, approximately 58,000 people live in Chukotka, down from a peak of 150,000 during the Soviet era. It has been estimated that up to 20% of the regions inhabitants are indigenous people, of whom Chukchi are by far the most numerous¹⁶.

Reindeer husbandry in Chukotka is one of the primary subsistence livelihoods for indigenous people, mainly Chukchi but also Even, Koryak, Yukagir and Chuvan peoples. It is possible to talk of two types of reindeer husbandry in Chukotka – tundra and taiga. Tundra reindeer husbandry, characterized by long migrations between winter (interior) and summer (coastal) pastures reflects the reindeer husbandry practiced in the areas visited by the EALÁT work-



16 Chukotka Duma, 2004



Gathering reindeer in brigade 4, Kanchalan, Chukotka, March 2008. SDM.

shops. The origin of reindeer husbandry among Chukchi is unclear. Traditionally, Chukchi society was bound by the interaction between the Chukchi reindeer herders of the inland tundra and the Chukchi and Yupik coastal villagers. Marine mammal hunters and reindeer herders created a mutually beneficial trade for food, clothing and goods.

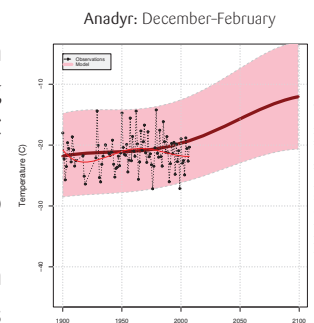
The Soviet period had an immense impact on traditional forms of reindeer husbandry in Chukotka. Between 1931 and 1946, private ownership of reindeer was outlawed in the Soviet Union and *kolkhozy* (collective farms) were established, though the pace of change was relatively slower in Chukotka. As late as 1941, 90% percent of all reindeer in Chukotka remained privately owned. The post war period saw a focus on increasing meat production and by the late 1980's the number of reindeer approached 500,000.¹⁷ The collapse of the Soviet Union, a chaotic privatization process, and the termination of state subsidies saw a very difficult transition period in Chukotka. The number of reindeer fell to 90,000 by 2001, the most precipitous fall in all of Russia. The number of people working in the livelihood also fell, from 2,272 in 1976 to 837 in 2001.¹⁸

A major theme of the EALÁT workshop in Chukotka was underpinned by the story of the rebuilding of reindeer husbandry in the region, and the visible effects of the physical reconstruction of Anadyr and Kanchalan. Reindeer numbers are also being built up again, a new reindeer slaughterhouse has been constructed in Kanchalan, and the local school and housing stock have been completely rebuilt. The

regional administration has embarked on a comprehensive review of reindeer husbandry to ensure more stable funding, with a view to increasing revenue from processing and distributing reindeer products. Private reindeer ownership has not yet been revived in Chukotka. In 2008, 92% of reindeer husbandry in Chukotka was under either public ownership or municipal enterprises. There are currently 16 municipal enterprises, 67 reindeer brigades, 630 reindeer herders and 285 women fully employed as seamstresses. All in all several thousand people, are involved directly and indirectly in reindeer husbandry.

Climate Change and Variability

The climate in the region's capital Anadyr is projected to change dramatically in the next century.¹⁹ This is according to empirical statistical downscaling of temperature data sets from Anadyr but is also supported by the observations of recent climate patterns by reindeer herders and local meteorologists who participated in the EALÁT workshops in Chukotka. The mean seasonal temperatures for Anadyr (1961-1990) were Winter (-20.7°C), Spring (-12.3°C) Summer (+8.5°C) and Autumn (-5.9°C).²⁰ By 2070-2099, winter and spring temperatures are projected to rise to -13.1°C and -7.3°C respectively. Likewise summer and autumn temperatures are projected to rise to 12.5°C and 0.0°C. Winter months are predicted to be warmer and winter will arrive later in Chukotka than today, so the risk of late rains and thick ice layers on pastures as a result may increase. In other words, at the end of this century, winter mean temperatures in Anadyr



¹⁷ Gray 2001.

¹⁸ Gray, 2006

¹⁹ Benestad, 2008

²⁰ Benestad 13/2008



Anders Oskal and Igor Togoshiev (Executive Secretary of the Chukotka Reindeer Herders Union), examining snow conditions on the tundra, March 2008. AK.

may approach those of Kautokeino, Norway in 2007. Herders expressed concern that warmer summers may reduce water availability for reindeer and increase the risk of tundra fires.

The climate is changing here. It is changing before our very eyes. Let us take last year as an example: a whole lake dried up. In February 2008 a lot of wet snow fell and a double ice crust was the result. We were forced to move our herds as quick as possible to more suitable areas. Let us take late November – early December 2007: Then it was raining for a whole week. All the snow melted and the rivers were without ice. The reindeer herders there were forced to move their reindeer to other places. It happened that they stood in the water up to their waist. But they managed to rescue their reindeer. We have extra expenses due to the extra moving of herds. [Because of climate change]

*Klara Gouvranroltat, reindeer herding specialist,
Lorino village, Chukotsky District, Chukotka*

First of all.. not all of Chukotka is getting warmer. In the North of Chukotka it is on the contrary getting colder. At all other stations it has got warmer. Especially during the last 5 years.. Black-flies and gad-flies were registered by our stations in the Chaunsky district. But earlier they were not seen there. These species have only established themselves here during the last few years.

*Alexey Yevstifeev, Regional Hydrometeorological
Observatory, Anadyr*

Regional variation was a theme that was returned to during the workshop, particularly in reference to the extreme climate variability that exists in the Chukchi Peninsula.

Summer pastures are really good there [Northern part of the Chukotka peninsula]. Just ideal. But winter pastures spoil the picture because of regular icing. Every 11 years you must be prepared for big problems. And if in such a situation you don't have the possibility to move, you are lost. This is what happened in both 1974 and 1994. If you do not have the possibility to manoeuvre, that is the end... When I worked there and went to the reindeer herds, my hair stood right up in despair. [...] People were helpless; they couldn't do anything to help their reindeer.

Vladimir Etylin

Although Chukotka is in a climatically challenging region for reindeer husbandry, this variability means that herders accumulate a great deal of knowledge about snow and snow conditions,

We often have bad snow. I was taught from my childhood how to evaluate snow and the reindeer pastures. For this was our life. We always looked first at this.

*Peter Etylin, elder reindeer herder
Konergino village, Chukotka.*

The main thing is that a reindeer herder must live for his reindeers' sake. This was well understood by reindeer herders from their early childhood on. Only then will a reindeer repay a thousand fold, for example in the form



«Remember, it is not us reindeer
herders who have been the cause of
climate change.»

Chukchi sledges, packed for migration. SDM.

of high meat quality. Today our task is to make reindeer meat competitive again. In order to reach this aim we must remember well tested traditional knowledge about the influence of weather and snow on Chukchi culture.

Alexander Valgirgin, elder reindeer herder, Ust-Belaya village, Anadyrsky district, Chukotka and Chair of the Chukotka Reindeer Herders Union.

Additional climate challenges in the region for reindeer and herders are the summer temperatures which are also predicted to rise. Herders worry this might increase the risk of tundra fires which represents a loss of pastures. Every summer, thousands of hectares of tundra have burned in Chukotka. Fires were mentioned by several participants in relation to loss of pastures and concerns that these may increase with climate change.

I must admit that large areas in the forest zone were damaged by forest fires. The whole Anadyr district has practically burned down. There are many different sites of up to 286 hectares, which are damaged by fires.

Olga Mironenko, Chukotka Regional Forest Department, Anadyr

Since 1989 forest fires have occurred much more often. In only our district, over one million hectares burned. We are talking about an area which is 120 km wide and 230 km long.

Alexey Yevstifeev

The importance of finding water for reindeer was raised again and again – not an issue raised

in other workshops. With higher temperatures projected, this may become a greater challenge in the future,

In summer, our main task is to make sure there is enough water for the reindeer. This is a problem in our territories too. When a reindeer drinks well it fattens in the right way. If reindeer don't get enough water they get both thin and flat. Reindeer that don't drink enough water during summer die quicker during the winter time.

Peter Etylin

Despite these challenges, an elder herder reminded workshop participants that despite the challenging conditions in which they work, reindeer herders are used to all kinds of «weather».

I will would like to say that reindeer herders like all seasons of the year. Both the winter, the spring and the autumn and so on... Reindeer herders used to prepare themselves in time for the next season, they were always one season in front. In the summer a herder for example already prepared the herd for the coming frost while the ground was still bare, when water would be hard to get to and when there still was no snow on the ground. In other words, the herd was prepared for all possible natural phenomena.

Alexander Valgyrgin

Several participants still saw a changing climate as a threat. An elder herder made the point that reindeer herders were not responsible for



Chukchi reindeer herder participating in the EALÁT workshop, March 2008. SDM.

climate change, while reminding of close ties between reindeer, man and nature.

Remember, it is not us reindeer herders who have been the cause of climate change. The reindeer know what paths to take. Many people have lost their connection with nature, but the animals maintain this connection and that is why we follow the reindeer.

*Senior herder Vassily Nomchaivyn, Brigadier,
Brigade number 4, Kanchalan*

Loss of Pastures

While loss of pastures from tundra fires was highlighted, loss of pastures from development has not been seen as a pressing issue since Soviet times, when reindeer numbers were much higher. However, a number of development projects are planned, primarily in the mining sector. This has been noted by reindeer herders and was also linked to water quality.

But we have problems with geologists. Sometimes geologists illegitimately occupy places. Partially this happens in our higher lands where they enter the summer pasture areas. They chase us away and are offensive. Things get especially difficult when they use our reindeer drinking sites for their water transportation. There were cases when the lips of our reindeer became inflamed, probably because of this.

*Zinaida Kaantokai, reindeer husbandry veteran,
Kanchalan village, Anadyrsky District, Chukotka.*



Community based workshop on the tundra of brigade 4, Kanchalan, 1st March 2008. AK.



Senior Chukchi herder
Alexander Pelyavge. AK.

Unlike other EALÁT workshop locations, an issue for reindeer herders in this region was the presence of wild reindeer, which are a challenge for reindeer herders.²¹ With the collapse of the Soviet Union, wild reindeer populations expanded rapidly and this was also cited as a threat to pastures.

Problems started in fact during the 1980's. The reindeer population increased a lot and problems arose. We don't say that domesticated and wild reindeer became antagonists but there were cases when domesticated reindeer disappeared with wild reindeer, even

whole herds of domesticated reindeer disappeared that way.

*Vladislav Nuvano, Chukotka Branch of the
North Eastern Complex Research Institute,
Russian Academy of Sciences, Anadyr.*

As a result, pastures experienced a double burden. Formerly herders would move away from the migration routes of wild reindeer to other pastures or ask permission from neighbours to use their pastures temporarily. More research on this topic and long term monitoring of wild reindeer herds and their interaction with domestic animals was called for, to address this challenge.



²¹ Family-based Reindeer Herding (2004)

The «khargin» reindeer breed of the Chukchi. The name literally means «dark» colour. SDM.

Fires also result in a loss of pastures in Chukotka.

Fires destroy a lot of pastures. Last year I took part myself in the fire extinguishing work when the tundra caught fire. Qualified firemen were non-existing. As you remember there were firemen in the villages before. [...] But now even our workers who were called in to extinguish the fire didn't get paid a ruble for this. Nothing!

*Oleg Yatynto, reindeer husbandry specialist
and Mayor of Kanchalan*

Traditional Knowledge and Adaptation

Many examples of traditional knowledge and adaptations were cited during the workshop and subsequent discussions, covering issues of herd structure, diet, the role of women, clothing and the relationship with the reindeer.

Our workshop deals with reindeer pastures. I have all reason to believe that our reindeer herders are the living carriers of traditional knowledge. If these things are combined [scientific and traditional knowledge] it will help reindeer husbandry very much.

Igor Togoshiev

I believe that it is very important to preserve the ancient history of the Chukchi people. I am very thankful to those who initiated and implemented the EALAT project in order to preserve traditional knowledge in reindeer husbandry.

*Anna Kutynkeva, Veterinarian, Bilibinsky District
Administration, Chukotka*

Traditional knowledge and how it was enacted through the dense trading networks established between herders in the interior and marine mammal hunters on the coast was cited as the glue that bound both the region and its peoples together.

The significance of barter as a branch of traditional knowledge cannot be overestimated. This was eradicated when the Soviet Union drew the borders for the collective farms, halting thousands of years of fruitful contact. Already ages before capitalism and ages before Marx wrote «Das Kapital», market relations existed between Chukchi marine hunters and reindeer herders. Coastal hunters and tundra reindeer herders created their market and exchanged products. Fairs for trade and pleasure were arranged at many sites. In this way a sustainable culture developed.

Vladimir Etylin

Keen attention was paid to the composition of the herd – for different reasons – and several participants noted this and that this knowledge was a gift that should be shared and communicated with others,

Once I worked in Ros'hytagyn's brigade. There I noticed that these reindeer herders were very eager to engineer the right female composition of their herd. The collective experience of the reindeer herders of Chukotka should be made known to others too.

*Peter Omrynto, reindeer herder,
Deputy of the Chukotka Duma*



The traditional reindeer sledge of the Chukchi, using two draught animals. SDM.



Herd diversity. SDM.

I consider the Chukchi reindeer breed to be unique, and not only for gastronomic reasons. As for what concerns the areas, all territories are good, if we only practice relative borders and herds can move in a «ribbon route», reach the salty coast and migrate back to the continental zone where there are no problems with icing.

Alexander Valgyrgin

Nowadays, no-one will bring us artificial

feed if there is an ice crust emergency. The only way out is to make use of the possibilities which lie in the right structure of one's reindeer herd. Use the possibilities of the herd, I repeat, the herd! The possibilities of the herd!

Vladimir Etylin

I must say that we too have icing sometimes. This in spite of the fact that we are located in the forest zone. For example, after sudden rain in the autumn, reindeer lichen



Reindeer grazing on dry grasses. SDM.



Grazing efficiency by the herd of brigade 4, Kanchalan, March 2008. AX.

gets wet and icy. Then we look for places with less ice and find them in the bogs. The snow might even have melted there. If this has happened, it gets frozen during the night. But such snow will be dry. In order to rescue the herd we have to move to the forest zone then. Possibly there will be no ice on reindeer lichen there.

Dmitry Khodyalo, veteran reindeer herder, Hero of Socialist Labour, Omolon village, Bilibinsky district, Chukotka.

In the latter years of the Soviet period, there was

a push to increase reindeer numbers and this was detrimental to the quality of the reindeer,

The policy of just increasing their numbers did great harm to reindeer as a whole. As a result reindeer scored lower on all the parameters ... That's why reindeer husbandry first of all became guarding. Feeding, care and keeping became less important. That's why the condition of our reindeer worsened. Our reindeer became smaller and weaker. Their reproductive capacity was reduced. Their immunal defence against illnesses was weakened. Let



me give you an example of this: The skins of reindeer became weaker. A man of average strength and a woman can now tear a reindeer skin. Only very strong people could boast about this in the 1950's and 1960's.

Alexander Volgyrgin

As with many other reindeer peoples in Russia, Chukchi rely to a large degree on reindeer for transportation and this requires a great deal of highly specialised traditional knowledge.

It is important to have draught reindeer for the sledges, one can't manage without them. Many young people now don't know how to train such reindeer.

Peter Etylin

Another [reason to have castrates] has to do with transport. Castrates are the best transport animals. Reproductive animals cannot be used for transport during or after the rut.

Vladimir Etylin



AX.



Valeria Nomchaivyna preparing food for the guests, March 2008. AK.

Castrated males are important for another reason and this may be a key adaptation strategy for Chukchi reindeer herders if, as is predicted, climate variability increases. The presence of castrated males offers an insurance policy against those times when access to pastures is made difficult due to icing,

«Chymnat» [castrates] are the main ice crushers in a reindeer herd. I have talked with many reindeer herders... they say that the herd structure is also a way to be able to rescue the herd. Because of this it is absolutely necessary to have castrates in a herd. When people started to drive with machines at this farm the castrates disappeared from the herd struc-

ture. And who then will then break the ice? [...] People would not have been able to domesticate reindeer without castration. It is one of the corner stones of the domestication process... [...] Castrates have many functions in a reindeer herd. One is that they are the calmest animals of a herd which means that a reindeer herd with castrates quiets down easily.

Vladimir Etylin

Other workshop participants made clear that traditional knowledge was a key survival strategy for successful reindeer husbandry.

Reindeer herders knew exactly how to manage their herds and what their reindeer



Maiya Nomchaivyna. According to Chukchi tradition, only women may slaughter reindeer, March 2008. SDM.



Reindeer herder Vassily Nomchaivyn and his grandson, Yaroslav. Brigade No. 4, March 2008. AX.



The community based workshop in Kanchalan, February 28, 2008. AK.

ate. And how much they ate. Reindeer herders also knew very well where to stop for a drinking place. They knew when half [the stomach] of their reindeer was filled or three quarters of it. Only such balanced feeding can give good results.

Alexander Valgyrgin

When there only were some centimetres of melted water left in a brook, herders would line their reindeer up in a row and not cross this brook until they had drunk enough. Drinking

places are very important for reindeer. And it is important to that they do this drinking at the right time...

Alexander Valgyrgin

Acquiring these skills of course can only be learned over time and these careful lessons in reindeer husbandry are learned from childhood.

From early childhood we were trained to remember reindeer which looked a bit different from the others. Because of this reindeer



The Chukchi «Yaranga» is specifically adapted to the climate conditions of Chukotka, AK.

herders can see whether a herd is someone else's herd or theirs, or whether some part of their herd has separated from the main herd and run away. «Always memorize the reindeer which goes in front, and the ones who most to the left, to the right and behind». These were instructions based on reindeer herders' experience as to how to herd reindeer.

Grigoriy Ranavoltun, Chukotka Branch of the North Eastern Complex Research Institute, Russian Academy of Sciences, Anadyr.

It is important to provide the right conditions for the herd in order to be able to regroup the herd when this or that natural phenomenon occurs. Even a herders «greeting» to his reindeer are important.

Alexander Valgyrgin

I would like to tell you something: My husband Kaantakai spent all his time together with older herders. They often told him: «Don't take a reindeer, go on foot! Go on foot! Study the pastures carefully! Go on foot! If you do that, you get to know your pastures much better than when you use reindeer transport». And now we even want to fly in helicopters.

Zinaida Kaantakai

The importance of the Chukchi language to reindeer husbandry was highlighted by several participants – as a bearer of the culture, as a means of transmitting culture to the youth and as a tool upon which the livelihood and the people depends,



The EALÁT workshop continued inside the Yaranga, March 2008. AK.



Reindeer herders...have chosen «koragyn-retgyrgyn». «Korany» means reindeer and «gynretgyrgyn» means «to protect», «to take care of», «to keep reindeer». In other words: it means that herders themselves have chosen this hard work. We know that they are the sole carriers of the Chukchi and the Even language. Other people who have lost or are losing their reindeer husbandry, such as the Nganasan and the Yukagir, have problems maintaining their mother tongue. This happened because they have lost reindeer husbandry.

Anna Kutynkeva

A topic that was turned to again and again in discussions in this workshop was the importance of traditional knowledge as it relates to clothing, and the key role that women play in maintaining life on the tundra.

It's impossible to survive in our area with poor clothing. There are so many snow storms. This influences the quality of herding too. If a herder has poor clothing he cannot guard his herd well. Before our women sewed clothing for herders who were looking after the herd in the tundra for a number of days on end. Those



Vasily Nomchaivyn, Reindeer herder, Brigade 4, March 2008. AK.





Reindeer meat is the core of Chukchi herders diet. SDM.

herders didn't leave...they stayed with the reindeer herd. This was possible because they had good clothes which were well sewn. Now the quality of such clothing is very bad.

Peter Etylin

Women who are young now don't get anything for their work. When they sew and serve, they must get paid for it. Especially when they are so few. Without them the tundra will become empty. And this is what is happening. Young men don't have girl-friends or wives any

more. They are single. This is very bad for reindeer husbandry. It cannot continue like this.

Zinoida Kaantakai

I remember endless migrations....Earlier I didn't pay much attention to this fact. But now while I am getting old, I must say that I feel really impressed when I think back to how much hard work was done by women in the tundra. Unfortunately there are too few women in the tundra now.

Grigoriy Ranavroltyn



It is very important to try and transfer this know-how to young people so that they can hand it on later. It is also important to hand on know-how to our grandchildren.

Zinaida Kaantakai

Dialogue, communication and capacity building

The need for contact, dialogue and knowledge sharing was highlighted by herders.

Though our land is very cold and very windy, we anyway have to do our work. It is very positive that we meet each others on events like this one. I think we should be optimistic. Meetings like this one, give us extra energy to move forward.

Zinaida Kaantakai

We very rarely can gather like today. This is a fact. I don't think there has been such a seminar during the last 20 years. A seminar for both young and old reindeer herders, where the experienced old generation can hand on their experience to the younger generation.

Oleg Yatynto

A concrete proposal from the workshop in Chukotka was to establish a monitoring centre for reindeer husbandry and traditional livelihoods in Anadyr. The purpose of such a centre would be to address the challenges of climate change, wild reindeer populations, forest and tundra fires and information sharing.



Anne-Maria Magga with pupils at the EALÁT workshop, Kanchalan. SDM.



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Reindeer on migration to the coast, Finnmark, Norway. IMGE.







Photo: Johan Mathis Gaup



Photo: Alexander Kotsky



Photo: Ellen Inga Turi



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