

Future Challenges for Reindeer Herding Societies



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Future Challenges for Reindeer Herding Societies

Report from a workshop in Umeå, Sweden
20-21 March 2007



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Reindeer husbandry is of great economic and cultural importance for many indigenous peoples in the Arctic and represents an interesting traditional way of life. Although the life of reindeer herding families has always been demanding, the circumpolar reindeer industry today faces major challenges. As pointed out in the Arctic Council report *Arctic Climate Impact Assessment* (ACIA, 2004), the predicted global climate change is expected to be particularly pronounced in the Arctic and could have a large impact on reindeer husbandry. Other major future challenges for reindeer herding and the reindeer industry are analysed in two reports from the Arctic Council, *Sustainable Reindeer Husbandry* (2002) and *Family-based Reindeer Herding and Hunting Economies, and the Status and Management of Wild Reindeer/Caribou populations* (2004). Challenges involving societal factors, gender, tourism, pasturage etc. are mentioned as important elements.

Attempts have recently been made to map ‘Sami-related’ research, which includes both reindeer husbandry and social sciences, e.g. by the Norwegian Research Council. In 2006, the Swedish government commissioned an overview of Swedish research concerning sustainable reindeer husbandry and other Sami-related research. Major conclusions were that research should contribute to solving applied issues, that traditional knowledge should be incorporated and that Sami society should have access to advisory and information bodies that could gather, translate and communicate relevant research results to potential end-users.

The *International Centre for Reindeer Husbandry (ICR)* recently established in Kautokeino by the Norwegian government is one example of a structure for conveying knowledge for sustainable reindeer husbandry. Another important communication tool is the scientific journal *Rangifer*, published by the *Nordic Council for Reindeer Husbandry Research (NOR)*, which is supported by the Nordic countries and Nordic Council of Ministers.

Within the Arctic Council, coordination of research projects and studies is aimed at achieving synergy effects in the whole circumpolar area. At the Arctic Council Sustainable Development Working Group (SDWG) meeting in Moscow in September 2006, a new project entitled ‘EALÁT’ was presented for endorsement. It was assumed that in the future more reindeer-related projects will apply for endorsement by the Arctic Council. The subject of reindeer-related issues could be advanced by forming a cluster of projects dealing with sustainable reindeer husbandry. A proposal was put forward to arrange a workshop to analyse and discuss this issue. Two major concerns were mentioned; adaptation to climate change and traditional knowledge in adaptation and management decisions.

This paper is a documentation from a workshop in Umeå, Sweden on 20-21 March 2007, with the aims to:

- Discuss, analyse and elaborate on the options for forming a cluster of relevant projects dealing with future threats to sustainable reindeer husbandry.
- List identified knowledge gaps.
- Recommend potential relevant research directions to be part of such a project cluster.
- Complete a draft report to be further developed (by NOR) for later endorsement by the Arctic Council.

The main focus areas of the workshop were:

- Adaptation to climate change.
- Societal factors.
- Traditional knowledge in reindeer husbandry.

Stakeholders such as reindeer husbandry organisations, researchers, agencies and government representatives were invited.

The workshop was supported by the Swedish Ministry for Foreign Affairs.

Åke Barklund, Managing Director
Secretary General
KSLA

Annika Åhnberg, Moderator
Chair of General Section
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Introduction

Annika Åhnberg, conference moderator and Chair of KSLA General Section, Royal Swedish Academy of Agriculture and Forestry

We have now come to the point where the Academy is to increase its activities in reindeer affairs concerning challenges for future reindeer husbandry. Climate change is one of the important issues that we have to deal with. Identifying the knowledge gaps that need to be filled and developing research clusters in the area of reindeer husbandry were other issues we wanted to see addressed at the conference in Umeå.

Helena Ödmark, ambassador and SAO to the Arctic council, Ministry for Foreign Affairs, Sweden

I am happy to welcome you all to Umeå and to this workshop on 'Future Challenges for Reindeer Husbandry' organised by the Royal Swedish Academy of Agriculture and Forestry and supported by the Swedish Ministry for Foreign Affairs as a contribution to the work of the Arctic Council Working Group on Sustainable Development (SDWG).

The Arctic Council (AC) consists of the eight Arctic States (Canada, Denmark, Finland, Iceland, Norway, Russian Federation, Sweden and the United States) and six organisations of indigenous peoples in the Arctic, including the Sami Council and RAIPON, which both represent reindeer herding communities. The AC has eight observer states and also other observers such as the World Reindeer Herders' Association and the European Commission.

Sweden is arranging this workshop to provide a forum for discussion between academic scientists and reindeer herders on research activities undertaken or contemplated. Previous discussions and projects conducted under the auspices of the AC have shown a fragmented situation where valuable information and im-

portant scientific research results have not been speedily communicated to reindeer herding communities. Also, it is obvious that when scientists are not familiar with concerns and urgent problems that trouble reindeer herders they are not, and cannot be, involved in addressing those concerns and searching for solutions. Better means for contact and better channels for communication both ways are obviously needed. Lately, and particularly during preparations for the 'International Polar Year 2007-2008', there has also been a lot of talk about the need to combine traditional knowledge and academic science. Climate change is a high profile subject area for research during the IPY. It is important that scientific work is relevant to all sectors of society, including indigenous peoples.

We hope that this workshop will enable academic scientists and reindeer herding practitioners to improve their communication and dialogue – for mutual benefit.

Reindeer husbandry development: an overview of research institutions and other actors

Rolf Egil Hagerud, secretary, Nordic Council of Reindeer Husbandry Research (NOR)

Research in reindeer has been developed in all countries where the reindeer/caribou is distributed (*Rangifer t. tarandus* L.). Most notable was the research in the former Soviet Union with the main focus on animal health and production. Later on there was important research in Alaska with the emphasis on basic physiology, health and population ecology, mostly concerned with wild reindeer (caribou). The research in Soviet Union and Alaska obviously inspired Nordic research, which was rooted both in the general traditions of academic research and education and in applied research institutions.

The research from the end of WWII and on-

wards may be crudely divided into two periods:

1) The *Biological Period* had a practical approach where health questions and basic knowledge of physiology, development of fodder, assessment of the pasture resources and reasons for loss of animals were the main aims of the research. Later on there was a focus on growth, reproduction and mortality, and on research on herd structure and strategy for slaughtering. The period was also the dawn of modern research in social sciences and law, in ethnography, in anthropology, history and in land rights issues related to reindeer husbandry.

2) The *Holistic Period* started with the Chernobyl accident in 1986. This event moved the reindeer research to clearly see the global impact and environmental significance for the reindeer pastures long before climate change was on the research agenda. Together with reindeer-Sami questions, environmental issues often linked to resource use have been much in focus in this period, which may be divided into several areas of knowledge: a) environmental questions, b) resource-related questions, c) animal management-related (=animal science) aspects, d) holistic aspects including reindeer industry and reindeer culture, e) culture-related research (traditional knowledge), and f) reindeer husbandry society aspects (rights, socio-economics, economics). A inter- and multidisciplinary tendency developed, often with research bound to relatively large programmes.

The research has extended and diversified, and is now incorporating the whole reindeer industry and all parts of society connected with the industry. Some of the research has also taken quite new directions. With and without the climate impact as inspiration, there are ongoing studies in the sustainability, vulnerability and resilience aspects of the reindeer husbandry system. Such research is multidisciplinary and holistic in its approach. Another new path in

research is the focus on practical knowledge, so-called traditional knowledge. Furthermore, the rights to use the pasture land and the protection of such rights are being studied both in a historical perspective and in the perspective of indigenesness and human rights. Research in economics and marketing are relatively new research fields.

Reindeer husbandry research is carried out by quite many research organisations in the Nordic countries. There are, however, only two Nordic research institutions working solely with reindeer or reindeer husbandry; the specialist Reindeer Husbandry Unit of the Swedish University of Agricultural Sciences (SLU) in Uppsala and the Finnish Game and Fisheries Research Institute's Research Station in Kaamanen. The latter is mostly working in a biological context; the former covers a broader research spectrum. They are both quite new institutions, both from 1994. Previously reindeer research in Sweden was carried out by a Reindeer Experimental Division at SLU, with a experimental station in Gällivare. Reindeer industry-related research in Sweden is also carried out at Umeå University, SLU departments in Umeå, Uppsala University and Stockholm University. In Finland the experimental herd in Kutuharju (near Kaamanen) was established in 1964 and was used as a base already before the establishment of Kaamanen research station. Reindeer-related research in Finland is also carried out in the RKTL division in Helsinki, Lapland University and Arctic Centre in Rovaniemi, Oulu University and Helsinki University. In Norway, the Sami (originally Nordic) institutions Sami University College incl. Nordic Sami Institute (NSI) in Kautokeino are working in different research fields related to reindeer husbandry (social sciences, law, history, Sami language etc.), mostly with social and humanist science perspectives.

Other important research environments in this area in Norway are University of Tromsø and other applied research institutes in Tromsø, University of Oslo and other institutions in Oslo, University of Biosciences (UMB) in Ås, and the Norwegian Nature Research Institute (NINA) and NTNU in Trondheim.

Future challenges for the reindeer husbandry

Malin Brännström, director, Swedish National Union for Sami People (SSR)

Traditional reindeer herding is characterised by close contact with nature, following the path of the reindeer between summer grazing areas and winter grazing areas. During thousands of years, reindeer herding has developed and adapted to the extreme cold as well as the midsummer heat. Living within nature and with the help of nature, without upsetting its balance, is a pattern that Sami largely follow. The traditional lifestyle is to live of what nature and the land provide. Reindeer herding, also in

modernised forms, is a very important part of the Sami culture and the basis for existence of the Sami reindeer herding communities.

Reindeer herding is based on nature and the Sami must be granted access to forest lands to continue with it. One of the biggest challenges today is to ensure that every Sami reindeer herding community has access to enough grazing areas. There are several future threats and challenges for reindeer husbandry, seen from a Swedish perspective. One is the traditional way of living, close to nature and with the help of nature, without upsetting the balance. The environmental issues have indeed been very important for us for as long as anyone can remember.

Economic, politics and justice affect the reindeer herding in different ways. We have to bear this in mind when we discuss today's topics. However, the great threat is the conflicts of interest when it comes to use of land. During the past 100 years, the use of land by others has changed the situation for reindeer herding. During the past 30 years, reindeer breeding Sami have lost large areas of pastureland due to



Foto: Anders Esselin.

various kinds of economic interests. The Sami lifestyle is constantly threatened through land exploitation for purposes such as forestry, damming, mining and road building. Modern forestry has in particular made it more difficult for the Sami to feed their reindeer in the natural way in the wintertime. Large areas of winter grazing land have been lost. Such land exploitation has slowly changed the possibilities for the Sami to carry out reindeer herding and to keep the traditional way of life. We must find ways to use land together, not excluding each other. Knowledge about different methods to achieve this is very important. Today there is an imbalance of power when it comes to use of land. There is a political unwillingness to face these problems and this leads to more conflicts.

There is a lack of knowledge in many areas. Many studies have been made that have given us important information, but there is still a lack of knowledge in many fields. One of the aims of this seminar is to identify knowledge gaps. This is a very important mission.

Traditional Sami knowledge equals sustainable development. I think our traditional knowledge could be used as a model. However, only fragments have been documented.

I firmly believe that our kind of traditional knowledge could and should be of national and international importance. I think it is high time that Sami people were invited as experts and specialists, in national and international affairs, also in the wide areas on sustainable development issues, and not just limited to reindeer husbandry issues as today.

Traditional knowledge

Ole Henrik Magga, professor, Sami University College, Norway

Human beings gather knowledge basically for two purposes: *survival* and *meaning*. Long before

the development of modern science, which is quite young, indigenous peoples have developed their traditional ways of knowing how to survive and also of ideas about meanings, purposes and values. Indigenous peoples view the world we live in as an integrated whole. This is one of many definitions of traditional knowledge:

A cumulative body of knowledge and beliefs handed down through generations by cultural transmission, about the relationship of living things (including humans) with one another and with their environment. Traditional knowledge is an attribute of societies with historical continuity in resource use practices. (http://www.ceamf.ca/06_legal/06_index.htm)

Traditional knowledge has been recognised by the *International Council of Science* as a scientific way of handling data and knowledge, although it differs from traditional Western science in structure, function, origin, basis and age.

There are many good reasons why traditional knowledge should be respected and used. All knowledge has an inherent value, indigenous communities and cultures are dependent on traditional knowledge, traditional knowledge has - as a rule - not been superseded by other kinds of knowledge in these communities and traditional knowledge is available when needed. In addition, there are certain obligations in international law, such as the *Convention on Biological Diversity*, article 8j, from the Rio Summit in 1992, according to which governments shall 'respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities'. The ambitions of the indigenous peoples themselves are expressed in article 29 of the *Draft United Nations Declaration on the Rights of Indigenous Peoples*.

In Sami culture, there are many fields where traditional knowledge represents a specialised knowledge base that has made survival pos-

sible through millennia. There are hundreds of concepts of snow and ice, and even more of reindeer. There are 14 denominations of male reindeer in North Sami according to age and whether they are castrated or not.

Some years ago, I carried out a pilot study together with Dr. Nicholas Tylor from the University of Tromsø and Mr. Mathis A. Sara from Kárásjohka, in order to compare the knowledge a biologist and a traditional reindeer owner had focused on through many years of work with, and observations of, a reindeer herd. The important facts for the biologist were age, weight development, reproductive abilities, health condition and genealogical facts. The owner focused on general appearance, behaviour, mobility, willingness to follow or lead other animals, position in the herd in grazing situations, ability to defend the calves, time for giving birth to calves, condition in the spring, the ear mark and ownership of the animal and other functions that had to do with the survival of the herd. Both kinds of knowledge are of course needed.

We need to gather more traditional knowledge and treat it in a systematic way. Like any other form of knowledge, it needs to be treated with care and criticism. It has to be questioned and scrutinised. In our work with the challenges of climate change, we do not look upon traditional knowledge as merely as a source of 'data' for science. In our common endeavours aimed at finding out more about the universe we live in, we cannot afford to reject any possibilities of new insights about reality.

Climate change and reindeer herding

Per Rosenqvist, secretary, Swedish Government Commission on Climate and Vulnerability

The Swedish Commission on Climate and Vulnerability was set up by the Swedish

Government in June 2005. Mr Bengt Holger-sson was appointed head of the Commission. A special report on the risks of flooding in the great lakes Mälaren, Hjälmaren and Vänern was delivered on 1 November 2006. A final report will be ready by 1 October 2007. The Commission's remit is to map Swedish society's vulnerability to climate change in the short, medium and long term, to propose remedial action and to assess costs. The methodology applied by the Commission consists of a sectoral approach where sector dynamics are described. Two different climate scenarios, SRES A2 and B2, with two global atmospheric models are being assessed using regional climate models developed by the Rossby Centre, SMHI. The Commission has developed more than 30 climate indicators and is attempting to assess vulnerability by identifying how climate change according to scenarios might impact on conditions and damage in various sectors. The main features of the results include an increase in mean monthly temperature of between 2 and 7 degrees depending on site and season, and a 20-50% increase in annual precipitation but with a decrease in summer precipitation in southern Sweden.

Reindeer husbandry is defined in the remit as one of the sectors that should be assessed. The Commission's findings in the scope assessment phase were that there is limited availability to results from research and that it is difficult to establish unequivocal impacts and costs of climate change on reindeer husbandry. Possible issues that research might help clarify include refined indicators for reindeer herding (e.g. occurrence of unsuitable winter conditions), effects of ecosystem change (mountainous/boreal forest regions) also taking into account other land use (forestry), reindeer diseases (effects of warmer climate) and impacts of climate change on the infrastructure of reindeer husbandry.

EALÁT

Ole Henrik Magga, professor, Sami University College, Norway

This project focuses on the adaptive capacity of reindeer pastoralism to climate variability and change and, in particular, on the integration of reindeer herders' knowledge in the study and analysis of their ability to adapt to environmental variability and change. It aims at determining the extent to which meteorological parameters can provide a biologically meaningful description of the local conditions that influence the food supply for reindeer. It will summarise and compare scientific data and codified versions of herders' knowledge about the effects of variation in winter weather on the

availability of forage for reindeer in winter and the growth and quality of forage in summer. A central task is to codify herders' experience and perception of climate change, their coping mechanisms and their perception and assessment of the risk associated with different coping options. There is also a need to determine the non-climate factors that influence herders' ability to adapt to changing climate conditions and the constraints on, and opportunities for, coping associated with national and international institutions, governance and customary rights. One part aims at determining the independent effects of climatic perturbation on the lifetime productive performance of female reindeer. One of the goals is to determine the



Foto: Anders Esselin.

effects of local climatic variability and climate change on nutritional status and welfare of reindeer through understanding of physiological adaptation to change. The information will be synthesised at two levels: within Finnmark and between Finnmark and Yamal. The team will analyse and compare the vulnerability, resilience and sensitivity of the reindeer herding community to the interacting forces of change.

RENMAN

Bruce Forbes, professor, University of Lapland, Finland

The programme ‘Challenges of Modernity for Reindeer Management: Integration and Sustainable Development in Europe’s sub-Arctic and Boreal Regions (RENMAN)’ was funded by the EU 5th Framework 2001-2004. The programme called for a direct role for local stakeholders - reindeer herders - in the process of policy-relevant research. The purpose of RENMAN was therefore to develop new tools and models of participatory research and planning in reindeer management that would foster integrated and sustainable use of semi-domestic reindeer (*Rangifer t. tarandus* L.) and related living resources in northernmost Europe. Reindeer management is among the most important mutually competing uses of natural resources and the environment in the Barents Euro-Arctic Region. It is also one of the oldest and most resilient forms of livelihood in the region. Semi-domestic reindeer comprise a living resource that is central to the cultures of many northern circumpolar indigenous peoples, including the Sami, as well as non-indigenous peoples in some areas (e.g. Finland, Russia).

The project investigated both the human dimensions and the natural conditions of reindeer management, in order to formulate sustainable future scenarios. To achieve efficient integration of the work packages, an integrative sys-

tems analysis was conducted to assist the whole project in problem distinction, system identification, interdisciplinary understanding and sustainability evaluation. During each phase of the project – conceptualisation, implementation and reporting – herders were integral participants alongside the researchers. The project results therefore provide a complex picture of the position and role of reindeer management in both the physical environments and cultural landscapes of the research region.

Further examples of reindeer industry sustainability projects

Öje Danell, professor, Swedish University of Agricultural Sciences, Uppsala and Nordic Council of Reindeer Husbandry Research

Four examples of interdisciplinary reindeer husbandry research projects of common interest were briefly described: 1) Projections of climatic change consequences for the Swedish reindeer husbandry (a Swedish project), 2) Sustainability and resilience analyses of reindeer husbandry (a Nordic Council project), 3) Ecosystem Finnmark (a Norwegian project), and 4) Interpretation and evaluation of snow and ice from remote sensing using indigenous and scientific knowledge (a project with Nordic participation). The first three projects have a common perspective in the multi-purpose role of reindeer husbandry, including production of human food, livelihoods for herding households, social and cultural bases, defence of Sami rights, regional attractiveness and economy, and ecological services. The multidimensional roles make resilience issues important in the projects. The aim of the first project is to detect, discuss and evaluate adaptation possibilities related to different projections and scenarios of climate change consequences together with selected reindeer herding communities. The second project, still in the development phase, aims at detecting

historical and projecting future trends in reindeer husbandry conditions related to politics, economics, societal dimensions, technology and ecology. The third project is a multidisciplinary project with the focus on reindeer densities and production and their interactions and consequences for the ecology of the Finnmark area, the industry itself, social conditions and the administration and governance of the resources in Finnmark. The fourth project has a narrower focus, aiming to connect traditional knowledge about snow and ice with modern meteorological recording technology, particularly remote sensing. The ultimate aim is a better understanding of past and present snow and ice conditions and improved predictions of future conditions via experiments and modelling.

Climate change – report from a working group

What topics could benefit from increased circumpolar collaboration?

We may risk a human explosion in the Arctic due to easier access into the area, for example the opening of the North-east Passage and the future transformation of the Barents region into a gigantic exploratory zone for natural gas and oil.

There are also indications of a northern trend in international tourism, as well as a long-term potential/possibility/risk for migration from south to north due to climate change.

We can expect conflicts between various industries - such as forestry, bioenergy and other industries exploiting natural resources - vis-à-



Foto: Henrik Lundqvist.

vis reindeer husbandry. Will the outcome be positive or negative economically, ecologically and for society at large?

What are the most critical events facing us and how could we monitor and evaluate them? What is more important – slow and small long-term events or sudden dramatic, extreme events? Most likely both.

There are obvious fundamental gaps that need to be filled between reindeer herders and researchers. There are lots of issues being discussed among the herders and a lot of information just waiting to be processed by researchers and turned into scientific results and public information.

Previous research has been solely interdisciplinary, but now we see interdisciplinary approaches and finally a need to include the herders as well. This is very important – a collaboration between the universities and the Sami communities.

Umeå University and an additional 14 institutions in several countries have carried out a substantial three-year research project, including in-depth interviews with reindeer herders. The project has produced large quantities of results, for example a specialised website has been created (www.northportal.info), as well as a travelling exhibition. The project was funded by the EU. It is surprising that so few reindeer herders and researchers know about it. This stresses the need to improve even further on the side of visibility and communication.

One specific area for common research could be to focus on the effects of a period of climate change on reindeer husbandry and how reindeer herding societies can adapt to short and long-term changes, as well as criteria for the industry to be able to create ‘room for adaptability’.

What are the major challenges in these topics? It is important to increase the scientific colla-

boration. However this must not lead to large “heavyweight” project, which might hamper scientific diversity and independence. One way to avoid this might be to create partly independent research groups operating within the overall programme.

One way to develop and finance common research projects in the Arctic could be to include the Arctic Council in the process to promote the project for funding from the respective countries.

How can a fruitful cooperation be developed?

Several ways of cooperation can be developed: To begin consultations with relevant institutions and interested Sami organisations, to learn from successful international cooperative projects, to form international research clusters and to anchor the project(s) with Sami organisations.

A concrete proposal was presented by The International Knowledge Centre in Kautokeino in Norway to facilitate additional and important cooperative research projects regarding reindeer research – to approach the organisers of the International Polar Year(s) and advance Sami-related research into an IPY status project and to put forward projects to joint Nordic research funding institutions.

The Association of World Reindeer Herders has decided to establish a circumpolar research council - a council that can articulate what is needed from their point of view – however without any financial resources for research.

There must also be improved interactions between research and society - politics, the media and the public.

What is the next step in that process?

The Arctic Council should consider an open invitation to the entire research community in its member countries to initiate and organise an ex-

ploratory reindeer husbandry research conference with the aim of identifying areas where detailed knowledge is missing. Such a conference would allow researchers and research groups to begin interacting and interested Sami organisations and societies should be invited.

The Association of World Reindeer Herders endorsed this proposal and added that their own association could act as host for such an initiative.

Traditional knowledge - report from a working group

What topics could benefit from increased circumpolar collaboration?

There are two kinds of issues:

- Collection of traditional knowledge and documentation of this knowledge. It is important to collect the traditional knowledge that exists today within the reindeer herding societies, otherwise such knowledge will be lost. How can the researchers cooperate with the reindeer herders and share their knowledge? What do they think are important research areas and what kinds of problems do they have? Who owns the traditional knowledge? How will the researchers use this knowledge? How can the Sami people be part of the development?

- The well-being of the people in the reindeer herding area, for example how different people face the climate change or economic issues.

What are the major challenges in these topics? Sustainable reindeer husbandry is a challenge in itself. There is no model that works for all reindeer herding societies, because of the differences between different groups. However, the challenge exists to find such solutions.

Both scientific research and traditional knowledge are important, but we have to be critical. There is also the question about what constitutes traditional knowledge. We have to turn it around. How can the Sami access the research results and in what areas do we need more research?

The Arctic Council must define the principles and develop guidelines for researchers.

Cooperation and trust are equally important. However, cooperation is not something new; today there is existing cooperation between reindeer herders and researchers and in other areas.

What will the researchers use their knowledge for? It is important to stop telling the Sami people what to do and not see any value in their traditional knowledge. The aim of research is not to tell people what they should do, but to tell them what the researchers have tried and how it works. Then it is up to the individual reindeer herder to decide whether it is useful to him/her. Researchers can never say that their results are the only truth. It is also important that the researchers are aware of the power they have.

There are issues and traditional knowledge that are emotionally charged, for example spiritual issues. It is important for researchers to know where to draw the line and not to cross it. How do we give the knowledge to the children today? It was easier in the past, but today the children go to schools, the mothers work outside the reindeer industry etc. What happens to the Sami community when this gap exists?

How can a fruitful collaboration be developed? It is important to find a balance and both sides have an obligation here. The researchers must give credit to the Sami people for helping them with the research. Today there is an imbalance and the reindeer herders do not have a strong voice.

It is important that the Sami people do not

see the researchers as enemies. A lot of good research is being carried out today, but there is still a gap and traditional knowledge is important. For example, if there is a crisis in reindeer herding, the herders do not contact the researchers to solve the problem. Instead they try to solve it with traditional knowledge, with knowledge from the past.

What is the next step in that process?

Today there are many projects that focus on traditional knowledge. This is good and must continue, as a lot of information can be gained from traditional knowledge.

Communication and dialogue between the reindeer herders and the researchers are very important. There has been one previous project on communicating science to reindeer herders in Sweden. The project included seminars and very good discussions arose between reindeer herders and researchers, with feedback and new ideas. More Sami researchers are also needed.

What is a cluster and what function does it have? What is going to happen in the future? Every time a decision is made, it is important to ask the question: What is the benefit for the local people, the indigenous people? It is also important that the voice of indigenous peoples is heard. Today there is a gap between the reindeer herders and the Arctic Council.

ICR is a Norwegian centre. Can it be shared by the other countries?

Societal challenges - report from a working group

Perspectives

In order to solve the task of discussing *societal* challenges for the reindeer herding societies, the group initially had extensive discussions concerning the definition of the concept societal itself.

The group finally agreed on a multidimensional definition in which the concept societal is constituted by a number of components, each important for the final definition but each not equal in importance from time to time.

The dimensions discussed in the group were:

- Politics; on regional, national and international levels.
- Industry and industrial changes.
- Social behaviour and social institutions.
- Environment and ecology.
- Economy; from private to public economy.
- Legal questions and human rights.

What topics could benefit from increased circumpolar collaboration?

• Strategies for research concerning societal matters in the whole circumpolar area. The agreed definition on societal also implies that applicable scientific theories must be based on a holistic foundation.

• Development of indicators for societal changes, in order to be able to identify challenges. The indicators should be identified inside the proposed dimensions, e.g.

The decrease of pastureland through industrial encroachment, e.g. forestry, gas and oil industry and mining, is currently one of the most threatening issues for reindeer herding societies. We can envisage a number of topics related to that theme:

- Coping strategies for handling industrial conflicts with impacts on the decrease of pastureland.
- Legal matters concerning land rights and human rights for indigenous people.
- National and regional strategies for land use.
- Income factors for reindeer herders, including value scales for incomes within the group.
- Economics models for reindeer

herding, including cash flow within reindeer husbandry.

- Reindeer herding as a fundament for culture identity and for culture vulnerability.

What are the major challenges in these topics?

- Resources for research (money).
- Infrastructure to perform research.
- Network in research (better communication).
- Coordination of research.
- Research should be based on participatory methods.
- Creation of a necessary critical mass of researchers through cooperation.

How can a fruitful collaboration be developed?

- Develop methods for exchange of information.
- Find strategies for using FP7 (research framework programme).
- Attend existing conferences and meetings.
- Create new meeting spots with a participatory perspective that takes into account traditional knowledge.
- Base future studies/research on a holistic view.
- Disseminate the results of existing projects more effectively.

What is the next step in that process?

- To create a common vision for the research society concerned in research in reindeer herding societies - a vision based on a participatory approach and a holistic view.
- Reindeer husbandry communities need access to advisory and information services that can gather, translate and communicate relevant scientific research results to potential users. Such 'infrastructures' should be deve-

loped nationally, linked together in a network and cooperate at international level.

Some final observations

'There is a need to research the research, an investigation, how this kind of applied science is initiated, focused and evaluated. It is very important.'
Annika Åhnberg

'Indigenous communities do not see themselves as poor, even if they cannot document any cash flow, as long as they can live as they prefer. The attitudes are so different.'
Ole Henrik Magga

'At the end of the day, income is still crucial, for the individual and for the industry. This needs to be addressed in any discussion on sustainability.'
Sunna Marie Pentha

'You need to have your ethics clear when you deal with indigenous people and include their institutions.'
Anders Oskal

'Scientific knowledge is to explain the process - while traditional knowledge guides us in how to handle it.'
Öje Danell

'Strangely enough, in my country of Jakutia, the local climate seems to have become three degrees colder instead of warmer.'
Nikolay S. Karpov

'Some researchers have missed important aspects on living conditions, values and attitudes in indigenous families, so those researchers lose in relevance. We certainly need to involve Russian herders and scientists in a much more substantial way next time we meet.'
Bruce Forbes

I think our expectations have been fulfilled when it comes to cooperation between institutions and reindeer herders. A lot of activities seem to be going on already in those specific fields. So it seems that we can expect more and better interaction within the scientific fields and the reindeer society. We have now had a focus on the Nordic countries, but no input from North America, no real solid participation from Russian science or from the Russian reindeer community – and thereby not a real circumpolar representation or discussion. That still is the goal – that the kind of discussions we have had here will also take place within the entire Arctic and sub-Arctic region.

All of our discussions raised key issues that needed to be resolved, but that cannot be solved by scientists or herders alone. However if you approach the governments, then the Arctic Council might be involved. One such issue could be ethical issues, guidelines on how to deal with indigenous people from a scientific perspective. They have such guidelines in Canada and USA for research related to indigenous people. I believe such issues could be brought up fairly soon.'
Helena Ödmark

There is consensus about the need for this kind of meetings where a broad range of stakeholders, in particular scientific researchers and reindeer herders, can meet in face to face dialogue and share views on issues of concern. Scientific research can provide important input for the development of reindeer husbandry. Scientific research should be better used to address issues and solve problems of scientific concern to reindeer herding societies. Traditional knowledge should be better documented and it should be analysed together with results from scientific research. A process for dialogue should be initiated at national and local levels to open up for direct contact and communication between reindeer herding communities and scientific researchers on issues of concern.

Due to the diversity of the stakeholders involved

and their different individual approaches and goals, it is important that communication and cooperation is transparent, open and inclusive.

The Umeå workshop was an important first step in a much needed, and long overdue, new type of dialogue between scientific researchers and the reindeer herding community.'

Annika Åhnberg

Conclusions

There is consensus on the need for deeper circumpolar collaboration between scientists working in the field of reindeer herding in a broader sense. There is also a need for further discussions on the benefit of an Arctic research cluster. In the future, it will be an advantage to include scientists from Russia to a greater extent in the planning process.

The main knowledge gaps are identified as Climate Change, Traditional Knowledge and Societal Challenges, including a better collaboration between researchers and the Sami communities. These topics might be grounds for establishing an Arctic circle cluster. However, it is also necessary to identify on a more detailed level projects and other activities that might form part of a new cluster.

As a result of this workshop, the Academy will intensify its internal work in this field and also provide the Swedish government with the support to take a position before the next research bill to the Parliament.

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Reindeer husbandry is of great economic and cultural importance for many indigenous peoples in the Arctic but also represents a traditional way of life. Although the life of reindeer herding families has always been demanding, the circumpolar reindeer industry today faces major challenges.

The predicted global climate change is expected to be particularly pronounced in the Arctic and could have a large impact on reindeer husbandry. Other major future challenges for reindeer herding and the reindeer industry involve societal factors, gender, tourism, pasturage etc.

Attempts have recently been made to map 'Sami-related' research, which includes both reindeer husbandry and social sciences. In 2006, the Swedish government commissioned an overview of Swedish research concerning sustainable reindeer husbandry and other Sami-related research. Major conclusions were that research should contribute to solving applied issues, that traditional knowledge should be incorporated and that Sami society should have access to advisory and information bodies that could gather, translate and communicate relevant research results to potential end-users.



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