

Local knowledge and resource management

On the use of indigenous and local knowledge to document and manage natural resources in the Arctic





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ISBN 978-92-893-3921-6 (PRINT)

ISBN 978-92-893-3923-0 (PDF)

ISBN 978-92-893-3922-3 (EPUB)

<http://dx.doi.org/10.6027/TN2015-506>

TemaNord 2015:506

ISSN 0908-6692

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Layout: Hanne Lebech

Cover photo: Martin Schiøtz; M. K. Poulsen; Signelelements; ImageSelect

Print: Rosendahls-Schultz Grafisk

Copies: 200

Printed in Denmark



This publication has been published with financial support by the Nordic Council of Ministers. However, the contents of this publication do not necessarily reflect the views, policies or recommendations of the Nordic Council of Ministers.

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Foreword



Foreword by Greenland Minister of Fisheries, Hunting & Agriculture, Mr. Finn Karlsen

The Greenland Government accords high priority to the involvement of local “users” in the management of living resources. With the changing climate, the people in the Arctic are facing huge challenges. Many rely on natural resources for both subsistence and income. Successful adaptation to climate change and the sustainable use of resources requires observation of the environment and nature. Scientific knowledge of the environment is incomplete, and conventional scientific monitoring is logistically difficult. Local fishermen and hunters observe the environment all year-round. Their observations and knowledge are, however, not systematically used in the political decision process.

The government with many partners therefore organized an international symposium to encourage Arctic cooperation and exchange experiences on the use of community members’ knowledge and observations to document natural resources and inform the political process. The meeting drew participants from all the Arctic countries. Their discussions and conclusions are presented in this report. I hope you will find the report as useful as I did and that the fishermen and hunters observations will benefit the policy makers.

Nuuk, November 2014

A handwritten signature in dark ink, appearing to read 'Finn Karlsen', with a stylized flourish at the end.

Mr. Finn Karlsen

Greenland Minister of Fisheries, Hunting & Agriculture

Acronyms

ABA	Arctic Biodiversity Assessment
ACIA	Arctic Climate Impact Assessment
CAFF	Conservation of Arctic Flora and Fauna
CBD	Conservation of Biological Diversity
CBMP	Circumpolar Biodiversity Monitoring Programme
CAP	Common Agricultural Policy
ECORA	Integrated Ecosystem Management Approach
EIA	Environmental Impact Assessment
ELOKA	Exchange for Local Observations and Knowledge of the Arctic
FPIC	Free, Prior and Informed Consent
ICC	Inuit Circumpolar Council
IPBES	Intergovernmental Platform on Biodiversity and Ecosystems
KANUKOKA	Greenland Municipalities Association
KNAPK	Greenland Hunters and Fishers Association
NAO	Nenets Autonomous Okrug
NORDECO	Nordic Foundation for Development and Ecology
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNEP	United Nations for Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation

Background

This report documents a symposium hosted by the Greenland Ministry of Fisheries, Hunting and Agriculture, Exchange for Local Observations and Knowledge of the Arctic (ELOKA), and Nordic Foundation for Development and Ecology. The symposium was convened from 2–3 December 2013 in North Atlantic House, Copenhagen, Denmark.

The symposium was one of a series of three international meetings on indigenous, local and scientific knowledge in the Arctic in the winter of 2013–2014. The other two meetings were convened in November 2013 in Cambridge Bay in Nunavut, hosted by Oceans North Canada, and in March 2014 in Kautokeino, Norway, organized by International Centre for Reindeer Husbandry, UNESCO and other partners.

The purpose of this report is to summarize the discussions and conclusions of the workshop and present a proposal for strengthened community-to-community experience exchange and other cooperation activities on the use of indigenous and local knowledge to manage resources in the Arctic.

The symposium was organised with the objective of examining experience on the use of indigenous and local knowledge to document and manage natural resources in the Arctic and identify common problems, opportunities and strategic responses through exchange of participants' experiences. In addition, the symposium intended to contribute to assessing how the use of indigenous and local knowledge can effectively bridge the gap between the approaches taken by local resource management systems and those of government natural resource management agencies and lead to sustainable development.

The symposium was funded by the Nordic Council of Ministers' Programme for Co-operation with its Neighbours. Participants were drawn from Canada, Finland, Greenland/Denmark, Iceland, Norway, Russia, Sweden and USA. The minutes of the workshop are provided in Section 1 while the proposal for cooperation can be found in Section 2, and the workshop programme and participants are listed in Sections 3 and 4.

Participants at the symposium in North Atlantic House, Copenhagen



Front from left: Kári Lárusson, Rodion Sulyandziga, Bjarne Lyberth.

Behind from left: Martin Enghoff, Noor Johnson, Yulia Baramokhina, Alona Yefimenko, Galina Platova, Maria Tengö, Zenica G. Larsen, Nette Levermann, Finn Danielsen, Carolina Behe, PáviâraK Jakobsen.

Far back from left: Peter Pulsifer, Weronika Linkowski, Søren Brofeldt, Sune Sohlberg.

Not shown: Augusta Jerimiassen, Kia Hansen, Neil Burgess, Peter Sköld, Ravdna Eira, Svein D. Mathiesen, Tero Mustonen.

Summary

The Greenland Ministry of Fisheries, Hunting and Agriculture, ELOKA (Exchange for Local Observations and Knowledge of the Arctic) and Nordic Foundation for Development and Ecology organized a symposium on the use of indigenous and local knowledge to manage resources in the Arctic. The symposium was held in Copenhagen, on the 2nd and 3rd of December 2013. The participants were resource persons and specialists from civil society and government agencies with experience in this field. The objectives were to identify common experiences, problems, opportunities and strategic responses, so as to increase the cumulative impact of efforts to use indigenous and local knowledge to document and manage resources in the Arctic.

Experiences in the Arctic

The participants highlighted a wealth of experience with regard to the use of indigenous, local and scientific knowledge to manage resources. Key experiences included:

- Decision-makers among natural resource management authorities in the Arctic have sometimes limited contact with local reality and knowledge. Often local knowledge of local resources is closely linked to local interests in managing resources.
- Indigenous and local knowledge and observations contribute important information for the sustainable management of natural resources in the Arctic. Today, this information is used locally by community members, but it is only rarely being used to inform government decision-making on the management of natural resources.
- Reindeer herders' understanding of indigenous knowledge is that it is very practical, and that it can be reviewed and tested. They nonetheless have experienced that they have to work very hard with the democratic systems to get their knowledge taken seriously.

- For Arctic hunters and fishers, getting together and talking with government staff and each other about the status of natural resources helps share knowledge and mobilize natural resource management action.
- Community-based monitoring of natural resources is not just about data and observations. It is about a process of community engagement, education, and transmission of knowledge. When community members feed their natural resource observations and knowledge to their own leaders, community-based documentation of natural resources can be a very effective tool in enabling communities to have a greater “voice” in municipal, national, and corporate decision-making.
- In efforts to connect indigenous, local and scientific knowledge, it often takes time to understand each other. Therefore, it is important from the outset to be clear about the aims and the activities. The end product is, however, often more than the sum of the results of each activity.
- The interface between indigenous, local and scientific systems of knowledge is very important. Further attention to this can help make indigenous and local knowledge count at multiple levels of decision-making.

Challenges met

Common problems experienced by the participants were:

- Scientific knowledge is often valued, indigenous and local knowledge is not. Many community members in the Arctic have a wealth of knowledge and observations but they generally lack the documentation needed for informing the natural resource management authorities.
- Many indigenous peoples are simply trying to survive and obtain food. They have no time to think about indigenous knowledge or the future.
- The rapid industrial development in the Arctic has made it very important that indigenous and local people collaborate to inform decision-makers on natural resource management.

- There is limited experience exchange and competence building across the various efforts to connect knowledge systems and inform the political process in the Arctic. There is a great need to agree on a way forward with regard to increasing the use of indigenous and local knowledge to inform natural resource decision-making.

Future opportunities

Central opportunities highlighted by the participants were:

- Countries that have ratified the Convention on Biological Diversity are obliged to respect, preserve and maintain knowledge of indigenous and local communities. Aichi Target 18 states that, by 2020, traditional knowledge should be integrated in the implementation of the Convention. Moreover, one of the functions of the Intergovernmental Platform for Biodiversity and Ecosystem Services is to bring the different knowledge systems, including indigenous and local knowledge, into the science-policy interface.
- From a local perspective, there is a strong interest in being listened to, and in having a say in what is happening in the surroundings. Remotely set rules are not always applicable at the local level. “Co-production” of knowledge for management of resources may help make natural resource management rules and regulations locally relevant and applicable.
- Indigenous knowledge, local knowledge and scientific knowledge have their own systems for validating information.
- Indigenous and local knowledge systems have the potential to provide information that is both reliable and relevant for informing decision-making on natural resource management. It is however important that there are municipal and national government staff in place who can take action on management proposals from community members.
- Indigenous and local people themselves should shape collaborative initiatives.

Drying of sealskin in Kitsissuarsuit, Greenland



Photo: F. Danielsen.

Conclusions

Local and indigenous knowledge should be further internalized in the natural resource management decision processes at all levels in the Arctic. Ways for stakeholders involved in natural resource decisions to cooperate more closely need to be identified. The cooperation should be in a pragmatic way and based on an equal-level perspective, and it should encourage a true dialogue among the partners involved.

It was agreed that a proposal for cooperation should be developed so as to strengthen community-to-community experience exchange and enhance the use of indigenous and local knowledge to manage Arctic resources through community-based documentation of natural resources. The activities should contribute to:

- Share experiences and try new ideas out in practice, using different approaches to community mobilization and communication.
- Support the intergenerational transmission of knowledge.
- Develop a new generation of indigenous and local leaders, and educate a new generation of natural resource managers and political leaders that are able to use “both kinds” of knowledge.

- Expose politicians and researchers to “both ways” of looking at livelihoods, natural resources and natural resource use.
- Help support community-based efforts for mobilization of knowledge.
- Increase the visibility of community-based documentation of natural resources, and elevate the status of this work.

1. Proceedings of the symposium

The minutes below summarise the presentations and discussions at the symposium. For the purpose of quick reference, the key points raised during the meeting are highlighted as quotes in small letters.

1.1 Why does indigenous and local knowledge matter?

Rodion Sulyandziga belongs to one of the “forest indigenous peoples” of Russia. He said that indigenous knowledge was part of the daily life and activities of his people. Together with science, it is used for decision-making. There is increased interest in indigenous knowledge due to climate change, high rates of change in the Arctic and development interests in the area. Indigenous knowledge is also a high priority for the Arctic Council. He welcomed opportunities for further discussion and collaboration and to see actions on the ground. Rodion suggested that the focus should be on practical implementation rather than, for example, databases of indigenous knowledge.

Why does the use of indigenous and local knowledge to manage resources matter? Rodion said the use of indigenous knowledge is very important for resource management. From a local perspective, there is a strong interest in being listened to, and in having a say in what is happening in the surroundings. It can be a good way to get “buy in” and it can help make the rules more locally developed and applicable. Remote rules are less relevant locally. In small communities of less than 2,000 people in Russia, local knowledge implies integrity of existence in the world. When there is no respect from government and the broader society then the situation is different. Use of indigenous knowledge is linked to the survival of these peoples.

“From a local perspective, there is a strong interest in being listened to, and in having a say in what is happening in the surroundings.”

Peter Sköld said that community knowledge and indigenous knowledge all have to do with planning, governance, liability and innovation. Local knowledge skills have a great deal to offer for improving resource man-

agement in the Arctic. At the level of the individual, it is important for identity formation.

Noor Johnson found that around the globe, there are lots of materials in the sky, producing information from the sky. Local and community-based knowledge can be seen as the opposite end of the spectrum from remote sensing. These systems typically set the policies for governments. There has been a shift away from local knowledge to the technological solution for gathering data. Local and indigenous knowledge is important as a way of getting back to an understanding of the environment. In the Arctic there is a wealth of knowledge among community members. However, decision-makers are often divorced from this local reality and knowledge. It differs from area to area but in some parts of the Canadian Arctic, Inuit knowledge is being used to a larger degree in decision-making, but the systems are not working very well.

Nette Levermann said that indigenous and local knowledge for managing resources matters because local knowledge about local resources is linked to local responsibility. It also helps in obtaining faster responses from observation to management action. It is a legal requirement to listen to the fishers and hunters in Greenland.

Alona Yefimenko stressed the importance of indigenous and local knowledge, and how we could set new standards and find ways of better listening to this kind of knowledge.

Bjarne Lyberth found that it is all about ownership, continuity and money. Local ownership is crucial. Continuity is important as researchers come for a short period and, when they are away, the changes happen in front of the local people. With regard to money, scientists' activities can be costly.

Ravdna Eira said that local reindeer herders and scientists are in many ways similar. One has studied at university and the other has not, but they both possess a lot of knowledge. However, government decision-makers do not regard knowledge systems as equal. Herders' knowledge is not always taken into consideration. There needs to be a balance between science and the indigenous knowledge of the local people who are using the resources. In her view, environmental assessments should be based both on science and on indigenous knowledge. It is important that the indigenous peoples themselves understand this, as it helps them to survive. Indigenous knowledge can be viewed as the "power" of the indigenous peoples.

Zenica G. Larsen questioned whether there was a contradiction between science and local knowledge. She found that science and local knowledge could supplement each other. Society needs reliable data. Sci-

entific data and results can be tested and examined by others. Scientists have funding for a short time whereas local people are there all the time. Local people have more data and knowledge but they often lack the documentation needed for natural resource management administrators. It will be important to see how the two can complement each other and how indigenous knowledge can help guide government administrations.

"Indigenous and local knowledge for managing resources matters because local knowledge about local resources is linked to local responsibility."

Maria Tengö said that people and nature are often studied separately, in the social and natural sciences, and the insight that people are part of, not apart from nature, is lost. Indigenous knowledge can provide insights for better understanding of an interlinked social-ecological system, in particular in times of change. In a human dominated world, we need to cope with and navigate uncertainties and surprise, and build resilience. Indigenous knowledge and learning gives us a chance to learn from memories and how they are continuously adapted to the present.

Svein D. Mathiesen found there has been an explosion of human activities, also of scientific activities, in the Arctic. Indigenous knowledge is about building confidence locally. Because some of us are not indigenous, we cannot really engage in building indigenous institutions. The bottom line is strong indigenous organisations.

Peter Pulsifer suggested that the dominant Western systems might be coming to their limits and failing to provide a sustainable future. Indigenous knowledge systems can lead to a change in the trajectory we are on. We have "oceans of data and droplets of wisdom" (quoting Jhon Goes In Center). We need to move towards focusing more on wisdom rather than just on data.

Carolina Behe pointed out that there is still a need to establish co-governance and sovereignty in some Inuit countries. This is with the understanding that we are talking about two different knowledge systems. Indigenous knowledge is currently not valued to the same extent as scientific information. With all of the changes occurring within the Arctic, there is an increasing need to understand where potential "tipping points" lie. She said we will therefore need to rely on both knowledge systems if we are to move forward in the best possible manner.

There is a strong linkage between culture and environment in the Inuit culture, in which this is seen as part of the Arctic ecosystem. With this in mind, elders have spoken of natural rights – rights to engage with the environment, to be a part of the environment.

Reindeer husbandry in Indiga, Nenets Autonomous Okrug, Russia



Photo: M. Enghoff.

“The reality is there are different knowledge systems in place. Often indigenous and local knowledge are not valued and scientific knowledge is.”

Pâviârak Jakobsen found that, in his village in Greenland they have indigenous cultural stories, which are passed down the generations. They are not written down. Four years ago, they started writing things down so that the stories would be saved in the written language and descendants could read them in the future. It will be possible to see the change from the “dawn” of this society and into the future. Therefore, in his view, the indigenous and local knowledge matters.

Sune Sohlberg said that indigenous knowledge of local people provides capacity for local management. This knowledge needs to be retained for the future.

“There is legislation in place but there is no strong control. Increased use of indigenous and local knowledge may help keep resources well-managed.”

Yulia Baramokhina and Galina Platova stressed that indigenous knowledge is an essential part of the culture of indigenous peoples. To use the indigenous knowledge and transfer it to the next generation is central to indigenous lives. There is huge pressure on the environment. In Yulia’s village, Indiga in Nenets Autonomous Okrug, Russia, major land-use change is still limited but there is overhunting and overfishing. There should be a code or rules for fishing. There is legislation in place but there is no strong control. Increased use of indigenous and local knowledge may help keep resources well-managed.

Piitaaraq Løvstrøm of Greenland Government listening to community members' discussions of trends in the abundance of fish and other natural resources



Photo: F. Danielsen.

Martin Enghoff suggested that using local knowledge to monitor natural resources is a practical way of promoting the right to manage local resources. Using data from monitoring to manage resources brings the indigenous knowledge into the system of resource governance. It is important that the documentation is linked to management to make this

work. It is a practical way of supporting sustainable livelihoods in the Arctic communities.

Augusta Jerimiassen found that scientists' knowledge is obtained from education, whereas hunters' knowledge is acquired from living alongside the game. The government trusts the scientists and not the hunters. It is important that hunters and fishers are given an increased opportunity for their knowledge to be used by the government.

Weronika Axelsson Linkowski found that today, the natural sciences have almost "monopoly on truth" in nature, and yet the biodiversity is still declining. It is important to benefit from local and indigenous knowledge. It also promotes local rights to manage and govern their lands.

1.2 Governance and community monitoring: experiences from Russia

By Rodion Sulyandziga

There are 41 indigenous peoples in the Russian Arctic. They are living in very remote regions. The situation in terms of governance and self-governance are quite different among regions and peoples. Some are living as nomadic tribes with lifestyles based on herding, hunting and fishing (Nenets, Even, and others). The creation of Autonomous Okrugs has provided more rights and more opportunities for indigenous peoples living in these territories but the majority of indigenous peoples in Russia live in other provinces without any legal jurisdiction for indigenous peoples. There are major challenges of development and education. Most of the indigenous peoples are simply trying to survive and obtain food. They have no time to think about indigenous knowledge or the future. Capacity building for indigenous peoples is critical, particularly as Russia has approved ambitious programmes for the development of the Arctic regions. There has not been much attention given to the indigenous peoples. There is a gap between the rhetoric and what is actually happening at the local level.

"Most of the indigenous peoples are simply trying to survive and obtain food. They have no time to think about indigenous knowledge or the future."

Some of the Russian indigenous peoples are part of international projects aimed at learning from international knowledge. By learning from abroad, they hope in the future to be able to take more decisions

on their own lives. This is fundamental to the indigenous peoples in Russia. Otherwise they fear that they might disappear.

At the federal level, there needs to be more discussion about indigenous peoples' issues. The younger generation is facing challenges of unemployment and limited abilities for education. There is a gap between those on the ground in the small communities and those with an education, who tend to stay in the cities. Many young people are leaving the communities. There is a need to train and make indigenous youth interested in keeping the family, tradition and ancestral knowledge. If that does not happen then the indigenous communities will not survive. Ten of the Russian indigenous peoples number only 100s of people, and ten other indigenous peoples are between 1000 and 2000 people. A few indigenous peoples are more numerous but, generally, there are a large number of small groups in Arctic Russia.

The indigenous peoples need respect from the government through rules and regulations. Generally there is a good system in place to grant indigenous land rights, developed on the basis of Canadian laws, but little has been implemented in the past 14 years.

1.3 How increased international cooperation can contribute to the objectives of Conservation of Arctic Flora and Fauna

By Kári Lárusson

Three key aspects of Conservation of Arctic Flora and Fauna (CAFF) work are assessment, monitoring, and data service. The Circumpolar Biodiversity Monitoring Programme (CBMP) is a "network of networks". This programme has recently developed terrestrial, marine and freshwater monitoring plans for the Arctic. It was the intention that indigenous knowledge and community-based monitoring should be integrated into these three plans but there is still much left to do, Kári said.

With regard to community-based monitoring, CAFF has published a Discussion Paper (2004), a Sacred Sites Survey (2004), and is about to publish an indigenous knowledge compendium on biodiversity. Kári's "dream" is to have an indigenous knowledge holder involved with each "knowledge network". CAFF's funding is however based on contributions from the eight Arctic governments and there is no budget for including indigenous knowledge.

Some activities within CAFF contribute to scaling up the use of indigenous knowledge. For instance, the Arctic Biodiversity Assessment (2013) recommends “recogniz[ing] the value of indigenous knowledge and work[ing] to further integrate it into the assessment, planning and management of Arctic biodiversity.”

1.4 Use of indigenous and local knowledge to monitor natural resources in Sweden

By Sune Sohlberg

The life of the Sámi of Sweden is different from before but their reindeer husbandry faces the same hardships. A central challenge is to keep the languages alive. A large part of the knowledge is sustained through the languages. With a few exceptions, reindeer husbandry is allowed in the protected areas in north Sweden.

“A central challenge is to keep the languages alive. A large part of the knowledge is sustained through the languages.”

As part of the Swedish County Administrative Board of Norrbotten and the Swedish Environmental Protection Agency efforts to sustain biodiversity, the government gives priority to keeping old traditions alive in the management of cultural landscapes, e.g. agrarian landscapes, restoring abandoned agricultural plots, and conserving the remnants of old reindeer husbandry traditions such as places where reindeer were gathered for protection and milking.

Sune found that the still existing local and indigenous knowledge was a fundamental asset in monitoring and managing natural resources. The European Union Common Agricultural Policy (CAP) is critical for the Swedish landscape. Current CAP-policies make it possible to support Sámi to protect small cultural historical sites that formerly was used for reindeer husbandry. It is important that this is included in the new 2015–2020 CAP.

The Swedish Environmental Protection Agency cooperates with Sámi villages to monitor wolverine, wolf, lynx, brown bear and golden eagle. Local and indigenous information is a cornerstone of the management of these species he said. Sune also mentioned that Sweden in the past had been involved with the project ECORA (“Integrated Ecosystem Management Approach to Conserve Biodiversity and Minimise Habitat Fragmentation in Three Selected Model Areas in the Russian Arctic”). This project had an activity on community monitoring on Kolguev Island in the Barents Sea. He also said that local people’s reports on wildlife are frequent on the internet portal “Species Gateway” of the Swedish Species Information Centre.

For Laponia World Heritage Site, nine Sámi villages are cooperating with the County Administrative Board of Norrbotten and the Swedish Environmental Protection Agency in managing this area. Sune also mentioned that a study on creating a web-based portal for indigenous knowledge on biodiversity had been commissioned by the government (www.slu.se/cbm).

1.5 Governance and community documentation: experiences from Greenland

By Nette Levermann

Greenland Ministry of Fisheries, Hunting and Agriculture run the scheme “Opening Doors to Native Knowledge”, also called PISUNA. It is a community-based local documentation and management system that began in 2009. The background to this is that hunters that saw a large group of marine mammals would call the minister by phone to ask for a larger quota. However, phone calls are difficult to use for resource management. The government initiated the project to strengthen incorporation of local knowledge into decision-making.

A community member observing seabirds off Nuussuaq Peninsula, Greenland



Photo: M. K. Poulsen.

The participants in PISUNA are the Municipality of Qaasuitsup, the Greenland Municipalities Association (KANUKOKA), Greenland Fishers and Hunters Association (KNAPK), Greenland Institute of Natural Resources, ICC-Greenland, the government and Nordic Foundation for Development and Ecology. The development of the PISUNA system was initially supported by the Nordic Council of Ministers and the Greenland government. Funding was used to support travel rather than paying participants. The cost of flights alone is quite substantial. The second phase (2013–2016) is supported by the European Commission.

"Hunters that saw a large group of marine mammals would call the minister to ask for larger quotas. However, phone calls are difficult to use for resource management."

The main activities are to establish local nature resource committees in each community made up of experienced local hunters, fishers and environmentally interested people. The council members select species to be monitored. They collect data on these species during hunting and fishing trips. Some of them use calendars so they can write down observations when they return home. Every 3 months, the data are summarized and interpreted. Possible management actions are discussed on the basis of an

evaluation of trends compared to previous years. The municipality can issue an order when it is approved by central government.

Examples of suggestions that have emanated from the system include conducting a winter census of reindeer, extending the Canada goose hunting season, and extending the period for collecting gulls' eggs, only from colonies of large white gulls (see Table 1). Some species such as char, crab, and muskox are not regulated internationally, and municipal decisions are fairly straightforward. It is a challenge that hunters are sometimes interested in stocks that cannot be regulated locally (whales, for example).

Generally, there is a large turnover of government staff in Greenland, which is sometimes a problem. One of the most important benefits is the creation of a dialogue between the government and environmentally-interested community members. Local documentation cannot replace scientific monitoring but it can direct focus towards a particular species or area that are in need of attention.

1.6 Governance and community documentation in Greenland: municipal perspectives

By Pâviârak Jakobsen

Pâviârak provided a municipal perspective on the same project. He said that at one point in time, community engagement was reduced. The communities said that government and the municipalities were not listening to them. When the municipality began making decisions on the basis of the proposals for management actions from the local nature resource committees, the communities could see that what they did had an impact, and their interest came back.

Table 1. Examples of monitoring results and natural resource management interventions resulting from the community-based local documentation and management system

Item	Monitoring result	Comments made by the local natural resource committees	Action proposed by the natural resource committees
Wolffish	Increased catch relative to effort by long-lines from dinghies	The population has recovered from decline in the past. Competition with shrimp trawlers for suitable areas at sea	Establish local authority bylaw to reduce the size of shrimp trawling vessels in a shallow sea area off Akunnaaq. Qaasuitsup Kommunia has decided to start a public hearing process
Reindeer	A total of 300 individuals were seen on Nuussuaq Peninsula. Insufficient data to assess the total reindeer population on the peninsula	The animals were very far inland. Some concern that the reindeer population may be disturbed by tourists	Conduct a census of the reindeer population on Nuussuaq. The community members would like to assist
Arctic tern	Daily observations from mid-May to September. All terns breeding at Kitsissunnguit, southern Disko Bugt, abandoned their eggs around June 15 in the 2011-breeding season	Overall, the breeding population in southern Disko Bugt is increasing. This is attributed to the recent ban on egg collecting at Kitsissunnguit. In 2010, the natural resource committee in Akunnaaq observed egg collecting at Kitsissunnguit by people from other communities. They informed them that this was illegal	Akunnaaq natural resource committee proposed strict enforcement of the ban on egg collecting at Kitsissunnguit and they volunteered to help enforcing this ban. They would inform visitors about the regulations and they would tell the government about possible violations. They would also catch stray foxes. The committee proposed limited 'traditional' collection of tern eggs on three small islets near the village for a 3-year pilot period. The committee would monitor the local breeding population of terns and they would document whether harvesting is sustainable.
Mineral and oil extraction	Increase in ship traffic related to mining and offshore hydrocarbon exploration	The natural resource committee in Qaarsut is worried about the potential impacts of the ship traffic on wildlife	The natural resource committee is keen to monitor the potential environmental impacts of the ship traffic

Source: *Polar Geography* 37: 69 (2014).

1.6.1 Discussion

Rodion said that, in Russia, many people have an understanding that we have to open up access from the outside to indigenous and local knowledge, even on sacred sites. Co-management of natural resources is an important concept that we need to focus on as that defines shared management responsibilities for the natural resources.

In Greenland, why was there a drop in the proposals from local fishers and other community members for a while? Pâviârak and Nette explained that the proposals from the community members did not get attention in the government system. Now the municipal government has a person asking every month to make sure that the councils are meeting and sending in data and management proposals. The government is taking the requests from the community natural resource committees seriously. The government has analysed the legal issues on what can and

cannot be done at municipal level. Some recommendations are about hunting times and amounts – such as longer hunting periods and larger quotas. The municipality does not have the power to make such changes. Everything has to be within what the legislation allows for. The documentation by community members is done for free, otherwise the system would be impossible to sustain over time in Greenland. The issue of incentives for the monitors is dealt with differently from one country to the next. Noor said that the experience from North America suggests that being paid is important but people are not paid for information. They are paid in compensation for the time they spend on the project when the same time could be used for something else.

With regard to ownership of the data, Carolina asked how information was being shared. In Alaska there is some reluctance to write down information as once written it is often used to promote another person or group's ideas of what should happen. Sharing information could therefore lead to declining quotas and reduced hunting rights that on short-term could affect the communities negatively. In Greenland, the most disaggregated form of the information stays at the community level and only the recommendations with supporting information are passed further up the system. The villagers own the data and observations but outsiders can ask for their permission to obtain copies of it. This is seen as very important.

The village of Saattut, Uummannaq Fjord, Greenland



Photo: M. K. Poulsen.

Ravdna said that the history suggests that data has been gathered from the local people and then used against them. For example, the Norwegian government told the Sámi people how to slaughter animals, and what to eat. It is a difficult balance. Various scientist-led monitoring systems are now working across the entire Arctic. Communities sometimes distrust what will happen with their data. They believe that people will want to analyse the indigenous knowledge. It is a problem that the people who collected the data and understand it are, in most cases, not part of the analytical process.

1.7 Community-based documentation and management of resources: an overview

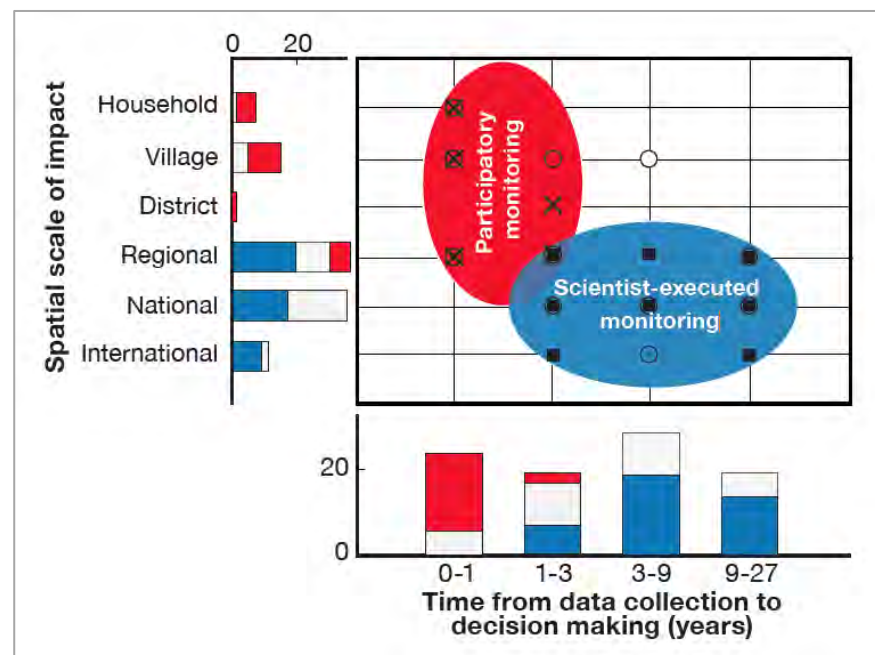
By Finn Danielsen

Finn gave an overview of challenges and opportunities in community-based approaches for documentation and management of natural resources. He found that arguments often heard in favour of community-based approaches are that these approaches can promote a holistic approach to natural resource management, can connect people to physical measurements, and provide information relevant for decision-making. On the other hand, arguments against using these approaches come from two sides. Some say that knowledge systems in principle should not be integrated or connected, and that local knowledge collected through participatory documentation promotes “Western scientific” interests rather than locals’ interests. Others say the community-based approaches are not suitable because many natural resources are shared across several countries and village perspectives are therefore not relevant or, because the methods are not reliable, it is a waste of time, and community members are understood as not being capable or interested. It may not only be a matter of different views. It may also relate to real conflicts of interest, because of the power associated with holding information.

Finn presented a spectrum of monitoring categories, defined by their degree of local participation, ranging from no local involvement in monitoring undertaken by professional researchers to an entirely local effort with monitoring undertaken by local people. He suggested that community-based approaches for documentation and management of natural resources might work best when the resources are important to the people, when the information generated has an impact on how the re-

sources can be managed, and when there are clear links from the documentation to the resource management regime. The approaches benefit considerably when there are policies in place that enable decentralized decision-making, and when they are supported by adequate organisational structures. The key motivation for people to participate is often to protect local access or rights over land and resources. It is rarely to contribute data to others or conserve threatened species. He discussed how collaborative documentation could link to improved natural resource management decisions. He presented evidence suggesting that scientist-executed monitoring mainly targets national and international stakeholders, and often takes several years from the start of data collection to the results being available to decision-makers (see figure).

Decision-making from natural resource monitoring based on data from published natural resource monitoring systems 1989–2009



■: scientist-executed monitoring systems.

○: monitoring systems with local data collectors.

×: participatory monitoring systems.

The circles comprise all the scientist-executed (blue) and all the participatory monitoring (red) systems. The bar chart indicates the number of scientist-executed monitoring systems (blue bars), monitoring systems with local data collectors (white bars) and participatory monitoring systems (red bars) at each level of spatial scale and implementation time.

Source: *Journal of Applied Ecology* 47: 1166 (2010). Courtesy John Wiley and Sons.

Participatory documentation often targets local decision-makers, and takes a shorter period of time. He showed results from comparisons between community members and scientists' monitoring. The findings suggest that if local people are committed and they have the tools, their results are not in any way inferior or less reliable.

Is it important to know whether the governance regime in an area mandates communities to document and manage resources or not. In some areas, local responsibility for documenting trends in resources is mentioned in a land claim agreement. In other areas, the governance regime only mandates communities to document and manage resources in very general terms. In some areas, the governance regime does not mandate communities to document or manage resources at all.

There were sometimes discussions between some people who say that the underlying observations (data) are not important at all, and others who say that they are crucially important. Another topic of discussion is how best to establish the system of exchange of information between the local and municipal (and national) level. One of the key challenges Finn mentioned was that, at the moment, there is no formalized experience exchange or competence building across the community-based documentation systems. The single schemes are isolated, and opportunities to link up with other schemes are not used. Moreover, community-based approaches for documentation are just considered an "add on". There is a need to elevate the status of this field.

1.8 Governance and community documentation: experiences from Finland, Murmansk and Siberia

By Tero Mustonen

On Tero's departure early the previous day from North Karelia, there was a large snowstorm. A small flock of songbirds was trying to avoid the storm. Tero said that these birds were like the participants in this meeting. The decisions made in Copenhagen and their urgency was symbolically linked to the "storm" underway in the Arctic and North.

In North Karelia, Finland, SnowChange Co-op, in cooperation with local villages of the Pielisjoki watershed, were recently able to successfully resist a Canadian uranium mining company that wanted to develop a large area of land in an unsustainable way. The company finally pulled out. Such resistance is imperative, Tero said. In Finland, SnowChange Co-

op works with three Sámi peoples of Finland: the North Sámi, Inari Sámi and the Skolts, in addition to local Finnish fishermen's communities. This cooperation has been founded, since 2007, on the mandate from the Sámi Council for the Eastern Sámi areas.

View from the village of Saattut, Greenland



Photo: M. K. Poulsen.

SnowChange engages with herders, fishermen, hunters and especially women in the villages. It is central that women are engaged in the work on traditional knowledge in the Arctic. SnowChange tries to make sure the women's voices are fully included in the work at all levels.

The focus of SnowChange is on climate change impacts, biodiversity and traditional land use. Most importantly, the notion of, and the need to listen to, the indigenous memory and mind are central concepts in the work. As an example of indigenous memory and the need to engage with the indigenous societies in order to understand current realities, one of the Sámi home regions, Vuotso (Sompio), Finland, was wrecked by the largest hydropower station development in Europe, Lokka and Porttipahta, in 1960s and 1970s. It flooded the Sámi communities, and some traditional villages and dwellings were burned by the government.

SnowChange has worked in this community since 2001 to collect oral histories with the Sámi on how and to what extent this change affected the peoples and what it meant for them, both Sámi and local people living in Vuotso. There is a legacy of brutal land use. So when we assess the ongoing and emerging changes in the North, we also need to engage with indigenous knowledge, memory and communities to understand past events that contribute to the present. These are not just “stories” or anecdotes but oral evidence of things, which have really happened.

There are many North American examples of “victories” in protecting indigenous peoples’ rights from state and industrial interests. In Finland, however, there has been only limited progress in this area. In one Skolt Sámi village in Finland, Sevettijärvi, the very first co-management of salmon has been initiated as a pilot plan since 2011.

In terms of indigenous languages and memories, for example, place names show how nature has changed. For instance, some Sámi names in Jokkmokk areas of Sweden indicate that pine forest once existed in areas that are now spruce forest.

As another example of a pilot action in Sevettijärvi, Finland, the Skolt Sámi herders have been equipped with digital cameras to document changes on the land as part of a collaborative management process. The reindeer herders observed the northernmost appearance of scarabaeid beetle (*Potosia cuprea*) in this part of Finland during the summer of 2012.

Indigenous land-use maps, while being insufficient to convey the multi-dimensional realities of indigenous life worlds, can contribute to a dialogue with the power holders. Land use and occupancy mapping allows indigenous communities to discuss and debate issues with the companies and the government regarding uses of the land. It is therefore important to work with the Sámi on mapping.

“Maps contribute to dialogue. That is what companies and the government use. So you have to work with the Sámi to do mapping”

Indigenous realities and knowledge can be in conflict with science and state management agencies, as in the case of salmon and catch-and-release initiatives. In Näättämö River, the Sámi have observed that recreational fishermen are causing problems as the catch-and-release fisheries result in the death of the fish once they are released back into the stream. This is due to stress and contact (where the fish skin and the protective slime cover is broken). Assessments of these “new management” options should therefore be done in concert with the indigenous knowledge holders so that a holistic approach can be taken.

In Siberia, SnowChange is assisting two nomadic reindeer communities, Nutendli and Turvaugin, in the Lower Kolyma region, Republic of Sakha-Yakutia, Russia. Melting permafrost has a direct impact on the livelihoods of the people. The community members have electrified pilot nomadic camp sites with solar panels. This means there is up to a 60% reduction in the overall costs of their fuel budgets at household level, even after taking into account the Arctic winter nights when solar panels do not work. Moreover, the pilot efforts at solar electrification of nomadic camps have contributed to positive social change

(see www.eloka-arctic.org/communities/russia).

Nomadic schools have proved useful. Young people will be able to study the Russian curriculum while based within their own culture, without having to move to towns to go to school. Nomadic schools are a way of keeping nomadic civilizations going.

In conclusion, Tero said that “all answers could be found in nature,” as the great, late Even scholar from Siberia, Vasilii Robbek noted. Returning to the opening story, small birds in the storm need to chirp and stick together to find a safe haven from the storm. He said that all the people in the room therefore needed to work urgently together to address and survive the storm underway in the Arctic.

1.9 Food security from an Alaska Inuit perspective

By Carolina Behe

Carolina presented an initiative of ICC-Alaska on Alaska Inuit perspectives of food security. The project shows that food security is synonymous with environmental health in the Alaska Inuit setting, in which the Inuit culture is part of the environment. In addition to discussing the Inuit led project, Carolina also shared thoughts on community based monitoring. She stressed that Inuit have been monitoring their environment for thousands of years and can contribute greatly to community-based monitoring programs. However, this does not necessarily mean that community-based monitoring programs are based on indigenous knowledge.

She suggested that the monitoring programmes that are most helpful for improving natural resource management, often are those where the indicators are selected by the indigenous peoples themselves, or produced by scientists and indigenous peoples together. There are generally

two knowledge systems with their own views of what was important and what needed to be monitored. For example, there are two ways of looking at fish; two types of questions being asked by the knowledge holders. Traditional knowledge tells us to observe the environment around fish, to understand the connections between riparian vegetation and the water, to recognize differences in the taste of the water, the texture of the fish, and so on. All of this information is needed to understand what is occurring and if fish should be eaten. Fish biologists often look at stocks and management decisions are based on this information. Both questions are needed; both approaches are needed. The traditional knowledge approach for assessing the health of fish populations have existed for a long time.

Carolina is member of the CAFF Marine Expert Group, and here it has taken time to convince other members that traditional knowledge methodologies and information are relevant and useful. Indigenous peoples themselves, not scientists, should define how and where the community members are involved, she said.

“The monitoring programmes that are most helpful for improving natural resource management are often those where the indicators are selected by the indigenous peoples themselves.”

1.10 Experiences from reindeer husbandry

By Ravdna Eira, Kia Hansen and Svein D. Mathiesen

Reindeer herders' understanding of indigenous knowledge is that it is very practical, and that it can be reviewed and tested. Sven said that they nonetheless have to work very hard with the democratic systems. The Sámi parliament may or may not be the proper place for a voice when you want to discuss management of natural resources. Sea Sámi have lost almost all opportunities to live a life similar to how the fishers and hunters live in Greenland, he said.

Within the Ealát programme, the reindeer herder organisations in Kautokeino are involved in a lot of activities across northern Eurasia. For instance, they bring Sámi youth into the Yamal area, and Nenets youth into Sámi areas. A “Nomadic Herders” programme was started through the United Nations Environment Programme in 2013 with a focus on reindeer husbandry in Mongolia and Russia.

Drying fish in Indiga, Nenets Autonomous Okrug, Russia



Photo: M. Enghoff.

International Reindeer Herders Association are very actively participating in Arctic Council meetings and processes, even if they are now sitting in the “back seats”, behind new observer states such as China. They sometimes found it very hard to voice indigenous knowledge in the processes of CAFF. They were particularly sad that when some natural scientists talked of threats to the tundra ecosystems, overgrazing by reindeer was mentioned and put on the same level as oil and gas and mining, even when there is huge encroachment by hydro-electric lines, and oil and gas developments. They considered this perspective unbalanced and not holistic.

“Reindeer herders’ understanding of indigenous knowledge is that it is very practical, and that it can be reviewed and tested.”

They would like to discuss how to navigate from here so that scientists and government agencies can take indigenous and local knowledge seriously. They are training future indigenous Arctic leaders in a two-year Master’s program with Russian, Scandinavian and Mongolian indigenous reindeer herding youth. They felt that the word “monitoring” was not very good. It is better to have a system to “look after” nature. They stressed that a lot of the indigenous knowledge is embedded in language.

They suggested that food and food culture could be used as an indicator of change, as it provides a measure of the connection between biodi-

versity and health in many Arctic communities. Young reindeer herders have been documenting the availability of pastures, the castration of reindeer, and the multiple types of snow from reindeer herders' perspectives. The documentation is undertaken through interviews with elder reindeer herders. They are also carrying out a project on the vulnerability and adaptive capacity of reindeer herders. Adaptive measures can, for instance, include supplementary feeding and flexible use of pastures. Local knowledge is used to help forecast the consequences of climate change.

Reindeer herd at Krasnoe, Nenets Autonomous Okrug, Russia during the Arctic winter



Photo: F. Danielsen.

1.11 Supporting the development of community monitoring networks

By Noor Johnson and Peter Pulsifer

With the increasing interest in community-based monitoring, and the long-term focus on local and indigenous knowledge, community-based monitoring and local and indigenous knowledge have been identified by the Board of the Arctic Councils Sustaining Arctic Observing Networks (SAON) as an important priority for Arctic observing. There is, however,

no clear sense of the scope and location of community-based monitoring. ICC-Canada is therefore collaborating with a number of organisations to develop a web-based atlas of existing community-based monitoring schemes in the Arctic (www.arcticcbm.org; see also *Arctic* 68: 13; 2015). Noor is leading this work with Eva Kruemmel of ICC-Canada. Noor showed the atlas and provided some examples of the kind of information that is becoming available in it. The next steps are to help synthesize information for practitioners about the kinds of community-based monitoring initiatives there are in the Arctic. They will then prepare a report on the state of community-based monitoring in the Arctic.

Peter Pulsifer told about the Exchange of Local Observations and Knowledge for the Arctic (ELOKA). ELOKA aims to provide data management and user support facilities to facilitate the collection, exchange, use and preservation of local observations and knowledge (see *Polar Geography* 37: 1; 2014). Network development is a high priority. Noor reported from a parallel workshop in Cambridge Bay, Nunavut, on community-based monitoring for the Arctic, hosted by Oceans North Canada. The participants were regional governments (within Canada), coordinators of community-based monitoring efforts in Canada, Alaska and Greenland, and representatives of hunters and trappers organisations. At Cambridge Bay, there was a consensus that community-based monitoring can be an important tool in enabling communities to have a greater voice in regional and corporate decision-making by feeding observations and knowledge back to their own leaders. This is of increasing importance for monitoring resource development projects, and it is directly relevant to impact benefits agreements in the mining, oil and gas sector. Noor also mentioned that, in some parts of Canada, community monitoring is written into the land claims agreement so that it is a responsibility of community members to monitor the land and resources. In terms of approaches to building and growing community-based monitoring, there was broad agreement that it is not just about data and observations but also about a process of community engagement, education and knowledge transmission. Identification of indicators of monitoring should come from the communities, the scientists and the decision-makers. Training and capacity-building is a critical element, and different approaches to community-based monitoring are evolving in the different regions of Alaska, Canada and Greenland, for instance in terms of incentives (payment of volunteers or not), technology use (high-tech or paper-based), and governance (the specific role of community monitoring in the governance of resources).

“Community-based monitoring can be an important tool in enabling communities to have a greater voice in regional and corporate decision-making by feeding observations and knowledge back to their own leaders”.

Noor then summarized the discussions in Cambridge Bay on how to enhance, grow and sustain community-based monitoring. Community-based monitoring systems need to generate useful information that people come to depend on for decision-making. If they are ultimately helpful for decision-makers, they will be sustained. One way to measure the success of community-based monitoring programs is to keep track of the number of natural resource management decisions using information generated from such monitoring.

What kinds of network are needed? Noor stressed that networks should support the use of indigenous and local knowledge by reflecting community needs and interests, and they should build on substantive community involvement. She said it would be important to identify meaningful indicators on the environment and natural resources for long-term monitoring. She also suggested that attention should be given to careful planning of data management and to ensuring the provision of regular information to decision-makers. It would also be useful to engage the support, funding and interest of the wider Arctic monitoring and observing community, she said.

Seal skinning in Uummunnaq, Greenland



Photo: M. K. Poulsen.

1.11.1 Discussion

The topic was the establishment of an international or Eurasian network on the use of indigenous and local knowledge to manage resources. Several participants would like to go ahead and develop this. Who would like to be a part of this? Where would the specific sites be? Svein said that there was a great deal of knowledge in the field, for example among the reindeer herders. They have to monitor every day, they look at the animals and the pastures and so on now that there are roads, mining, oil and gas. People have to start to write things down. He said that the various initiatives across the Arctic on connecting knowledge systems for improving resource management have many elements in common, and that there needs to be established a structure for cooperation and cross-fertilization. From the International Centre for Reindeer Husbandry there is strong interest in establishing a Eurasian or international network on the use of indigenous and local knowledge to manage resources. The challenges in Greenland are much the same as in Finnmark: the laws come from the centre. There is limited consideration of the local systems. There are two “ways of knowing” and, likewise, there are two ways of governing. How to structure this proposed new cooperation is perhaps a difficult issue. In some areas, it will be a challenge to establish local community-based natural resource monitoring councils like those in Greenland and Nenets Autonomous Okrug. But even in many of those areas, community members are autonomously monitoring the natural resources on their own every day. In recent years, cell phones are increasingly being used in the herder communities. This means that, soon, communities could have the same access to information as the oil companies. If it is decided to have a circumpolar monitoring network or cooperation of community members involved with community monitoring, simple methods for measuring snow and ice could be developed. Such approaches have to be very simple and very practical if it is to work well. It could be part of the Arctic Council’s work, which is sometimes good but also sometimes can prove difficult – or it could be outside of the Arctic Council. There are other initiatives as well, on global change and co-production of knowledge for the global north, for example led by UNESCO. Svein suggested that there should be developed a network based on science and indigenous and local knowledge and taking a very simple, practical and easy approach. The initiative should also enable training and courses. Peter Pulsifer mentioned the outcomes of the recent Polar Data Forum held in Tokyo, which discussed systems of data sharing including the Arctic Data Coordination Network. He

stressed that a network should be structured to suit the needs of the communities. An organisational set-up that is too overarching and formal should be avoided.

1.12 Indigenous knowledge and resource development in Greenland

By Augusta Jerimiassen and Bjarne Lyberth

Greenland had its Self-Government in 2009. Jurisdiction over minerals and oil was moved from Copenhagen to Nuuk. The International Labour Organization Convention 169 (1989) states that if a government or private sector wants to use the land then indigenous people must be consulted. Among the Arctic States, ILO convention 169 has been ratified by Norway (1990) and Denmark (1996) (<http://www.ilo.org/indigenous/Conventions/no169/>). Likewise, the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) demands so-called “Free Prior and Informed Consent” (FPIC) prior to development projects (<http://www.unesco.org/new/en/indigenous-peoples/>).

A Mineral Resources Act was recently issued in Greenland. This act is superior to other legislation. Guidelines for associated Environmental Impact Assessments (EIAs) have also been issued (www.bmp.gl). EIAs cover assessments of the environmental impacts of the entire life cycle for mineral or hydrocarbon extraction. During the scoping and exploration phase of such activities, the guidelines prescribe the inclusion of studies of local use and local knowledge of natural resources. Mining companies usually hire consultants to carry out the studies prior to the EIAs. A study of local knowledge is aimed at mitigating conflicts between the local use of the area for hunting, fishing and tourism and the mining activities. Such a study can be performed as a survey where representative groups of hunters, fishers, tourist organisers, local industries and others are interviewed. Those interviewed must be able to provide feedback on the presentation of their input to the reporting of the survey so as to double-check that their statements have been reliably reported. It is stated in the EIA guidelines that this study must be conducted in accordance with established scientific methods and with Greenlandic involvement.

[illegible]

To date, the Government of Greenland has issued about 120 exploration or exploitation oil and mineral licenses, all around Greenland, including inside the world's largest protected area, the North East Greenland National Park.

Local knowledge and resource management

were not invited to share their views on the potential impacts of the proposed activities, although several information meetings were held. She said that local fishers had reported a decline in abundance of Greenland halibut at Taseralik, on the mouth of Nassuttooq, which may be linked to seismic activities off Sisimiut in 2010.

“For the hunters and fishers, getting together and talking with each other provided an opportunity to share their knowledge and experiences about resource management challenges.”

Bjarne and Augusta also talked about the Pikialasorsuaq Northwater Polynya Cooperation workshop in September 2013. Polynyas are areas of year round open water surrounded by sea ice. Hunters met from Baffin Island and Qaanaaq in Greenland to share and exchange information and knowledge about polynyas. They discussed how to conserve the polynyas based on an indigenous knowledge approach. For the hunters and fishers, getting together and talking with each other provided a unique opportunity to share their knowledge and experience about resource management challenges and the polynya. As part of the workshop, the hunters' knowledge was documented.

According to Augusta, there is currently no legal instrument in place to incorporate local knowledge into decision-making on the future of the polynya. The hunters reported changes in snow and ice, and the presence of “new” species coming from the South.

1.13 Reindeer, biodiversity and community monitoring: experiences from Sweden

By Weronika Axelsson Linkowski

Weronika talked about the Swedish follow-up to the Convention on Biological Diversity (CBD) with regard to indigenous and local knowledge, and she presented experiences from a study of reindeer as indicators. The CBD stresses the need for “Free Prior and Informed Consent” with regard to the use of indigenous and local knowledge (articles 8j and 10c, see box).

The Swedish Government strives to find suitable ways to translate the CBD articles on the use of indigenous and local knowledge for natural resource management into practice. It is the responsibility of government agencies in each country to ensure that country's adherence to the CBD. Thirteen Swedish government agencies and other institutions are ascertaining who should be responsible for doing what. The work is led by the national programme on Local and Indigenous Knowledge related to the Conservation and Sustainable Use of Biodiversity, also called Naptek.

"The Swedish government strives to find suitable ways to translate the Convention on Biological Diversity articles on the use of indigenous and local knowledge for natural resource management into practice. It is the responsibility of government agencies in each country to ensure that country's adherence to the Convention."

Weronika presented findings from a study of the reindeer as "indicator". The objectives of this study were three-fold. First, it aimed to lift the value of indigenous knowledge both within the indigenous societies and in general. Second, it aimed to transfer indigenous knowledge between elders and youth, and connect indigenous knowledge holders with agencies and county boards responsible for natural resource management in Sweden. Third, it aimed to demonstrate the cultural value of mountains and that reindeer herding is one of the processes that shapes the habitat and is important to conservation of biodiversity.

In Sweden, reindeer are semi-domesticated. Today, across large areas, shrub and bush land is increasing (and plant diversity declining) due to the reduced extent of grazing and trampling by reindeer. Grazing is variable in time and space and often affects large areas. Some of the findings in the study suggest that grazing may lower the alpine treeline. Reindeer grazing provides less competitive plants the opportunity to establish and survive on mountain meadows or grass heaths, and grazing can thereby increase the diversity of plants. Moderate reindeer grazing is thus actually leading to increased plant diversity.

Excerpts from the Convention of Biological Diversity

“Article 8(j). Each contracting Party shall, as far as possible and as appropriate:

Subject to national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying indigenous lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge innovations and practices.”

“Article 10(c) and 10(d). Each Contracting Party shall, as far as possible and as appropriate: (...)

- *(c) Protect and encourage customary use of biological resources in accordance with indigenous cultural practices that are compatible with conservation or sustainable use requirements.*
- *(d) Support local populations to develop and implement remedial action in degraded areas where biological diversity has been reduced. “*

Ratification by Arctic States

Among the Arctic States, Canada, Iceland, Norway, Denmark, Sweden and Russia have ratified the Convention. Finland has accepted the Convention but not ratified it. USA has neither accepted nor ratified the Convention.

Source: <http://www.cbd.int>

“In efforts to connect indigenous and scientific knowledge, it takes time to understand each other. One should be clear about the aims and the activities.”

Weronika's key message was that “one plus one is more than two”. In efforts to connect indigenous and scientific knowledge, it takes time to understand each other. One should be clear about the aims and the activities. The end product is, however, often more than the sum of each activity. Weronika suggested that a useful starting point is to discuss common values. All participants need to agree on the way to work, study and carry out the specific activities. It can sometimes be useful to draw up contracts specifying potentially sensitive issues such as where results are to be stored. It may take time to agree on the terminology. It is also often useful to have a clearly articulated communication plan. Finally, who is going to benefit from the results must be made particularly transparent.

1.14 Connecting knowledge systems in pan-Arctic reporting: lessons from the Arctic Biodiversity Assessment

By Tero Mustonen

Tero spoke about the Arctic Biodiversity Assessment (ABA) report on the status of biodiversity in the Arctic and the role of indigenous and local knowledge in the report. Tero was a Lead Science Author and Indigenous Knowledge Coordinator for Eurasia in the development of the ABA in Eurasia. He compared the ABA with the Arctic Climate Impact Assessment (ACIA) in terms of significance for policy makers.

Housewall in Nelmin Noss, Russia



Photo: F. Danielsen.

The mandate given by CAFF was that “indigenous and traditional knowledge has to be included in each chapter”. He said that there was discussion about how to “get indigenous knowledge into” all the chapters. The first step was to have “direct” community voices presented and “named” in the opening of every chapter, introductions from the viewpoint of an indigenous or other local community member. Secondly, a dialogue was to be initiated with each lead author on how indigenous knowledge could be incorporated into a specific chapter. Examples of

past integration attempts from the ACIA process were shared with each lead author. Lastly an “Indigenous introduction” was secured for the whole Assessment.

There was, however, an inherent flaw in that the topic of the chapters mostly followed particular species or ecosystems, and indigenous knowledge was sometimes difficult to present in this way. The chief editor and Tero found individual solutions for the 25 chapters. Particular challenges included the issue of scale. Sometimes, indigenous knowledge information was based on one person’s observations from just one site, whereas the scientists’ findings covered larger areas. Secondly, a serious dialogue was missing, for the most part, between science and indigenous knowledge in terms of how indigenous cosmologies and tradition understand place, species and events as opposed to science. Plans exist for a separate Arctic Council indigenous knowledge compendium to be published with a compilation of the indigenous knowledge produced.

1.14.1 Discussion

Carolina said she provided ICC input to the review of each chapter of the ABA. She found this work quite challenging. CAFF attempted to include indigenous knowledge within the ABA; however, she found that this was not successful. CAFF is now creating a lessons learned report to evaluate the process for including indigenous knowledge. Svein was concerned that the ABA did not include the reindeer herders’ knowledge and perspectives about what was happening on the pastures. By not bringing this kind of information forward, if one followed the recommendations of the terrestrial chapter, one would in fact be contributing to a loss of biodiversity Svein said. Maria commented on the issue of scales in environmental assessments. She said that scientific studies were generally conducted within short timeframes and on a small scale. They may have limited capacity to generalize across larger areas. Indigenous and local knowledge, on the other hand, was often accumulated over a wider area and longer time and may therefore be very useful to decision-makers.

“Scientific studies are generally conducted within short timeframes and on a small scale. They sometimes have limited capacity to generalize across larger areas. Indigenous and local knowledge is often accumulated over a wider area and longer time and may therefore be very useful to decision-makers.”

Yulia Baramokhina presents summaries of observations of geese, large mammals, berries and fish made by community members in Indiga, Nenets Autonomous Okrug, Russia. Yulia is one of the coordinators of the local natural resource committee in Indiga



Photo: F. Danielsen.

Noor asked about the usefulness of assessments like the ABA. Tero responded that when they had begun the discussions on the ABA, there had been a widespread opinion that there was no mechanism whereby remote Eurasian, especially Siberian and Sámi communities could have a voice. He said that in his view the ABA had delivered what was expected from a scientific viewpoint. Carolina said that the Circumpolar Biodiversity Monitoring Programme builds upon the ABA. This program will develop new states of knowledge periodically. The current CBMP process does not, however, adequately provide for indigenous input. Sune commented that the ABA was the first major assessment made by CAFF. It was only intended to be a first baseline. It was not intended to involve land-use developments. He stated that there would be more assessments in the future, and they would include land-use developments.

Kári said that CAFF would like to coordinate new data compilation and develop a report on the State of the Arctic. Kári liked the idea of creating some kind of network that had arisen from the discussions at this symposium. He suggested that CBMP could be one of the venues where data from such a network could be fed into and lead to pan-Arctic reports to decision-makers. Rodion said that because of a lack of resources he was unable to attend to the ABA process. He found these

comments from ICC and Sámi about the inclusion of indigenous knowledge critical. He suggested that international standards within CBD and the World Intellectual Property Organization should be adhered to and that participating more in those processes could help promote the role of indigenous knowledge.

Svein was concerned that because the herders' perspectives were not included in the ABA, people were losing trust in environmental assessments and indigenous scholars were now establishing their own association. The new thing was that natural resources are being extracted from all over the Arctic. When producing a report like the ABA you have to have the herders' perspectives inside the assessment Svein said. Carolina agreed with him that there had not been the representation of indigenous peoples' perspectives in the ABA process that she would have liked to see.

1.15 Connecting knowledge systems in pan-Arctic reporting: lessons from the Arctic Human Development Report

By Peter Sköld

Within the International Arctic Science Committee, an important work priority was on indigenous peoples and change, including adaptation, and cultural and power dynamics. The Arctic Council's working groups had sponsored several projects on indigenous knowledge, and Peter highlighted the initiatives on beluga whales in Alaska, a study on ice-edge ecosystems and indigenous knowledge, and the development of ethical principles for research. He then stressed the important role of the University of the Arctic, and told participants about the SIKU, Sea Ice Knowledge and Use project, which had made it very clear that "Arctic residents' integrative vision of their environment can be invaluable to our understanding of the Arctic system in the decades to come".

The Arctic Social Indicators report highlighted the enormous resources in the Arctic that were potentially being targeted for exploitation in ways that conflicted with the indigenous uses and benefits of the land and resources. Peter then presented his experience of participating in the work with the second Arctic Human Development Report. He found that research focused on climate change as the primary source of community vulnerability missed other important forces that were shap-

ing vulnerability such as colonialism, globalisation, social and economic change, and political and institutional factors including, for instance, resource quotas. He told participants about Sámi and smallpox, and the cultural understandings of this disease in Sweden and internationally. He stressed the role of language as part of the “cultural capital”. Peter concluded by recommending an integration of local and indigenous knowledge into schools and university systems at all levels. He suggested establishing long-term observation databases. He stressed that there should be identified ways of cooperating pragmatically, and that they should include all knowledge sectors but be based on an equal-level perspective. He said that local and indigenous knowledge should be further internalized in the natural resource management decision-making processes at all levels.

“There should be identified ways of cooperating pragmatically. These should include all knowledge sectors and be based on an equal-level perspective.”

1.16 Connecting knowledge systems in global science-policy processes

By Maria Tengö

Maria said there had been a lot of talk about the need for connecting knowledge systems. However, there had been little attention as to *how* to do this. In recent years, Maria has worked particularly with the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES).

IPBES was established in 2012 and has 121 Government Members. When fully operational, it is envisaged that IPBES will play a role similar to the Intergovernmental Panel on Climate Change (IPCC) but with a focus on biodiversity and ecosystem services. One of the guiding principles for IPBES will be to recognize and respect indigenous and local knowledge on the sustainable use of biodiversity and ecosystems. One of the functions of IPBES is thus to produce synthetic global, regional and thematic assessments of the state of the planet’s environment, while “recogniz(ing) and respect(ing) the contribution of indigenous and local knowledge” so as “to bring (the) different knowledge systems, including indigenous knowledge systems, into the science-policy interface” (UNEP 2012).

“One of the functions of the Intergovernmental Platform on Biodiversity and Ecosystem Services is to bring different knowledge systems, including indigenous and local knowledge systems, into the science-policy interface.”

How can the different knowledge systems be connected? Key aspects here are that approaches for connecting knowledge systems must be legitimate, transparent and useful for all parties, both at the international and at the community level. A related but separate question is how to scale up knowledge from a small area to a large area. Indigenous/local knowledge and scientific knowledge have their own systems for validating information. Maria described the IPBES-dialogues processes in Jokkmok (2011) and Guna Yala (2012). At the Guna Yala meeting, a distinction was made between integrating knowledge (i.e. components of one knowledge system are incorporated into another through a validation process) and parallel approaches whereby knowledge systems are placed next to each other, using separate validation mechanisms and assessing insights. The thinking behind this is that indigenous/local knowledge and scientific knowledge are different manifestations of valid knowledge. This approach is described in the so-called “multiple evidence base approach” (*Ambio* 43: 579; 2014).

There was a need to find out how to jointly (scientists and community members) process and evaluate knowledge and make triangulations across knowledge systems. Maria recommended that the symposium participants pay attention to the IPBES process and use it in their advocacy to leverage connecting knowledge systems to inform natural resource management. Key ingredients for success in connecting knowledge systems are true dialogue among key partners, where everybody feels equally welcome. There must be respect for knowledge, knowledge systems and knowledge “carriers”. Networking among indigenous peoples and local communities is helpful.

“Key ingredients for success in connecting knowledge systems are a true dialogue among key partners, where everybody feels equally welcome. There must be respect for knowledge, knowledge systems and knowledge carriers.”

The Intergovernmental Platform on Biodiversity and Ecosystem Services

While one of the functions of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) is to produce synthetic global, regional and thematic assessments of the state of the planet's environment, it also has three other functions: promoting generation of knowledge; delivery of policy support tools and methodologies; and capacity building. IPBES therefore has a potentially strong role to play in promoting the use of new approaches that allow the improved capture of data and information, in promoting means for bringing together data and information from different knowledge systems, and in building capacity to do both.

Ratification by Arctic States

With the exception of Iceland, all the eight Arctic states are members of the IPBES.

Source: <http://ipbes.net/>; UNEP 2012 (Report of the second session of the plenary meeting to determine modalities and institutional arrangements for an intergovernmental science-policy interface on biodiversity and ecosystem services. UNEP/IPBES.MI/2/9. <http://ipbes.net/resources/previous-ipbes-meetings/second-session-of-plenary.html>).

1.16.1 Discussion

Svein asked if there were any plans on the part of the Stockholm Resilience Centre to develop resilience assessments where indigenous knowledge is integrated. Maria responded that resilience assessments “by the book” were rather big and complex activities and the approach needs to be improved. She said that perhaps one could look at what questions we can ask that can potentially lead to useful information. She said Svein needed to help the Resilience Network by finding out how one could do this.

Maria said that it was very easy to say that local knowledge should speak for itself but how to do it was more difficult. She said by way of example that it would be important to find practical indicators for the CBD. Martin agreed on the need to find practical and realistic solutions for connecting knowledge systems, such as good indicators. Finn said that, with colleagues, he had reviewed the potential for community involvement in monitoring of the CBD and 11 other international environmental agreements. They had found that, of the 186 indicators in these 12 environmental agreements, 69 (37%) required monitoring by scientists, whereas 117 (63%) could potentially involve community members (*Conservation Letters* 7: 12; 2014).

Gerth Olsen discuss the results of community-based documentation and management with Nette Levermann. Gerth coordinates the local natural resource committee in Akunnaaq, Greenland



Photo: F. Danielsen.

1.17 What kind of cooperation is needed, on the use of indigenous and local knowledge, to document and manage resources in the Arctic?

Ravdna stressed that it was very important that something tangible came out of this group that really supported the local communities so that the Arctic states would begin to listen. Svein said that, for small indigenous communities, it was particularly important to work internationally and develop the concepts of indigenous knowledge for resource government. To do just that, there was a need for better education. He said there were some differences between North America, the Nordic countries, and Russia in their approach in this field. He felt however that the Greenland governance situation seemed to be almost identical to the government administration in the Sámi areas of Norway. Food was central, and climate change was “on the table” in the future, as was health. Svein suggested there needed to be concrete ways to move this forward. He found this exceptionally important. Could the group agree on a simple system to monitor, for instance, birds among a network of participants who were at the symposium? He suggested that the group jointly write the ideas into a proposal for funding support so as to move to action.

Peter Pulsifer agreed on the usefulness of a larger proposal. Noor found it was good to learn from the discussions at this meeting, and that it was useful to continue this process. She also said that the group needed to keep in mind that there were also other processes going on at the moment where indigenous communities were thinking about how to co-produce knowledge. The communities needed to decide. Nette said that she strongly supported the establishment of an international network on the use of indigenous and local knowledge to monitor and manage resources. Nette said that she would like to see a set-up that focused on community-to-community approaches. Maria said a network around practitioners' exchange would make sense. She would like to also help provide links from the group here to other fora. Peter said that, from ELOKA's point of view, they would be happy to help provide this group with assistance on technology, integration, intellectual property rights agreements, advocacy in science bodies (such as Sustained Arctic Observing Network, and the International Arctic Science Committee – Pulsifer is Chair of the IASC-SAON Arctic Data Committee). ELOKA would like to help find out "how to do it right". He suggested it might at some point be useful to develop a multi-chapter book or white paper on what needs to happen and how to do it right. Establishing good communication was really important.

Carolina said that ICC was trying to address these concerns within the work of the Arctic Council. For instance, they were trying to develop new research mechanisms for co-production of knowledge in the Arctic Council processes. She would like to hear from more indigenous communities with regard to finding solutions. She said that indigenous knowledge holders were not necessarily going to develop research questions in the same way that scientists do. These are two different processes. She also mentioned the potential role of the World Indigenous Network. Bjarne was not sure what networks already existed but he saw a lot of potential in the use of indigenous and local knowledge to document and manage resources. He said that, with his background in natural science, he would suggest a forum for capacity building in these approaches around the Arctic. He liked the idea of community-to-community cooperation. He said that he did not know how to structure the network, whether it should be a hierarchical structure or not. Paviaraq suggested that, as a start, the website of the Greenland PISUNA scheme (www.pisuna.org) could provide links to websites of all the other initiatives represented at this symposium. There needs to be a natural resource committee or something similar in place in each community so as to make sure that the community members' observations and

knowledge are used – and taken seriously – by higher level institutions. Municipal institutions should always provide feedback to the natural resource committees on how they have dealt with community members' observations, knowledge and management proposals.

Yulia liked the idea of establishing a network or discussion forum. Not all Arctic communities had access to the Internet. This needed to be taken into serious consideration when planning experience exchange, training and capacity-building activities. Galina said that a priority was to develop a strong network among the indigenous peoples groups, and that there was a need to do this now. She also said that her organisation, Yasavey, had already discussed with Rodion the possibility of together holding a series of seminars across Russia on the use of indigenous and local knowledge to monitor and manage resources. She hopes their project in Nenets Autonomous Okrug (www.yasavey.org/index) will serve as a pilot scheme for testing the use of indigenous and local knowledge to monitor and manage resources in Arctic Russia. It was important that Russian scientists were keen on cooperation too. Without meaningful participation by both indigenous peoples and scientists, it would not be possible to succeed.

Reindeer husbandry in Indiga, Nenets Autonomous Okrug, Russia



Photo: M. Enghoff.

Kári said that he liked the idea of a network. In his mind, a network should ideally be something that contributes to the CBMP. There were different views within CAFF on community-based approaches to monitoring, but there was certainly interest, and this interest was likely to increase with time. Sune said that from Naturvårdsverket's point of view, it was important to maintain the close relationship that there was between the Swedish government and the Sámi. It was important that the knowledge of the Sámi was "organised" so it could be used for decision-making and natural resource management.

Alona said that in the Indigenous Peoples' Secretariat, they often focused mainly on Nordic and Canadian experiences, less so on Russian. She liked that at this meeting there were representatives from several regions of Russia, and their experiences were really being taken into consideration. As Carolina said, there was a need to find better ways of networking. There was also a need to consult more with the Permanent Participants in the Arctic Council.

Peter Pulsifer said that there was need to consider (1) money, which is a prerequisite, in order to open up the opportunities, (2) power in the communities and in other contexts so they have a chance to impact future developments, (3) logistics, how to find solutions to the challenges (e.g. on how to enable community-to-community experience exchange), and (4) ethics. He said that within the concept of indigenous knowledge there was a great deal of ethical wisdom, e.g. to guide how to run this and avoid situations where indigenous communities are almost taken "hostage". There was a need to find out how, for instance, research among indigenous communities is carried out in a respectful manner. He had a dream that, in 10 years, Arctic indigenous peoples can be driving these processes independently and have the resources available to produce 500 PhDs on topics of importance to them, if that is what they choose to do.

Zenica said there was a great need for further work on realistic approaches to make indigenous and local knowledge "operational" and, for instance, fed into the processes for decision-making in oil and mining development. She did not agree that "fishers and hunters are not heard at all" but said that there could be room for improved involvement. The key point, she said, was how in practice to feed indigenous and local observations and knowledge into the governance systems so that it could be used as something that decision-makers could base their actions on.

Weronika said that she found further networking on the use of indigenous and local knowledge to manage resources a very good idea but that the group needed to be aware that scientists and communities were

working at different scales. Moreover, it was important to let the communities themselves decide on what to monitor. She felt this was a challenge for the scientific community, which liked to make decision on this. Co-production of knowledge was a good way to cooperate with each other and teach each other. A key challenge was how to get the authorities to change their way of thinking and prioritizing. One way to start this would be to make government agencies aware of the articles in the CBD on this topic.

Rodion said that, from the Russian perspective, there was a need for activities at four levels: (1) the community level, (2) the national level (e.g. legislation), (3) the regional Arctic Council level and (4) the international level, such as the CBD and United Nations Environment Programme processes. Action needed to be taken at each level. There was a need to work on land rights, food and so on, and start from the base level. At the national level, there was a need for more dialogue, for instance, through workshops with officials and scientific institutions. There was a need to explain why indigenous and local knowledge was important, and what its role was. Rodion said that, in the Arctic Council, it was really up to the Permanent Participants to decide how best to address this. Internationally, however, Rodion suggested that participants needed to create something new and more practical so as to address all four levels. There was a need to work bilaterally and create joint activities, and to facilitate more training and capacity building, and connect indigenous and scientific resources. Martin suggested that the group together prepare a write up to help support the practical implementation of those activities that are most urgently needed.

1.18 How can durable programs be built?

Peter Pulsifer agreed that financial investment was needed but also stressed that, even without funds, it was still possible to do something. Noor said she saw value in supporting community-to-community exchange and interaction. Work with indigenous knowledge and community-based monitoring was one thing. Research was something else. For monitoring, there was always the problem of financial sustainability. If there were to be a network, it would therefore be important to think about sustainability so that people could continue observing and documenting local knowledge and observations into the future.

Maria said she believed in “organic” networks. She suggested that the group should proceed as a small group with a diversity of perspectives

on the use of indigenous and local knowledge of managing resources and that this, in her view, would be a good way to move forward. It could be useful to create a common shared vision, for example, to educate a new generation of natural resource managers on how to use “both kinds” of knowledge in order to manage resources, or to share experiences and try our ideas in practice.

Kári said that one had to be careful not to end up competing against one’s own network. This was a risk if a network became too large. Carolina said that community-based monitoring and indigenous knowledge communication were not synonymous, and this was important to keep in mind. There was a need to discuss the goal of cooperation and networking. Peter Pulsifer agreed that there was a need to define the goal. He also said that a first start could be a mailing network. Noor said that it would be good to discuss this further in a small group. Carolina suggested the development of a network that could address the four levels laid out by Rodion (community, national, regional, international) through community-based monitoring. She felt this could be a useful way to move forward. Martin suggested that the group could initiate a process whereby the participants together try to propose a structure and a vision for this cooperation.

1.19 What vision does the group have for the use of indigenous and local knowledge for managing resources?

The participants came up with 17 suggestions for what this vision should include. These suggested vision statements are listed below, as proposed by the group (in unedited format):

- Communicate to senior researchers, Arctic Council meetings and science media, and get “the message” to them thereby opening the eyes of the politicians
- Community-to-community experience exchange
- Develop shared indicators that are meaningful to communities
- Develop the capacity of a new generation of indigenous leaders
- Educate a new generation of managers (and political leaders) that are able to respectfully use “both kinds” of knowledge

- Elevate the status of this work, and increase the visibility of community-based documentation
- Encourage and support governments to incorporate local and indigenous knowledge into natural resource management decisions
- Establish a review board with strong authority
- Expose politicians and researchers to “both ways” of looking at livelihoods and natural resources
- For local and indigenous communities to get access to communication
- Help support community-based efforts for knowledge mobilization
- Help translate the CBD-principles on indigenous and local knowledge into every level of government activity
- In a short time, ensure that most people working in this area are indigenous
- Inform the work of Circumpolar Biodiversity Monitoring Programme
- Sharing experiences and trying ideas out in practice, using different levels of communication
- Support MSc and PhDs by indigenous peoples
- Support the transmission of knowledge between different generations and stakeholders

Carolina and Finn examined these vision statements. They found that six of them together largely covered all of the 17 statements. These six vision statements are: (1) Share experiences and try ideas out in practice, using different approaches to communication; (2) Support the transmission of knowledge; (3) Develop a new generation of indigenous leaders, and educate a new generation of natural resource managers and political leaders that are able to use “both kinds” of knowledge in a respectful manner; (4) Expose politicians and researchers to “both ways” of looking at livelihoods, natural resources and natural resource use; (5) Help support community-based efforts for mobilization of knowledge; and (6) Increase the visibility of community-based monitoring, and elevate the status of this work. They also found that the visions could all be encompassed within a possible overall objective for cooperation: Enhance the use of indigenous and local knowledge in decision-making through community-based documentation of natural resources.

1.20 Conclusions

Rodion Sulyandziga said that indigenous and local knowledge was a central component of the daily life of communities. He said there were many different indigenous and local communities. For example, in Russia alone, there were more than 40 different indigenous peoples. There were therefore also many different opinions. Some felt that indigenous knowledge was indigenous intellectual property. Others wanted to see more external involvement.

In his view, there was a need for more respect for the indigenous lifestyle but there was also a need for more dialogue and more understanding. New technologies combined with indigenous knowledge would create new opportunities.

Pragmatically, he suggested that Finn and Martin provide a summary of the meeting. He also suggested they could follow up by creating a proposal for donors. The next step would then be to meet, discuss and refine this proposal in the coming months, and to raise funds for the initiative.

***Village meeting to present and discuss the community members' findings and management proposals and to obtain feed-back from the entire community.
Disko Bugt, Greenland***



Photo: F. Danielsen.

2. Proposal for cooperation on the use of indigenous and local knowledge to manage resources in the Arctic

At the symposium, it was concluded that to strengthen community-to-community experience exchange and cooperation activities on the use of indigenous and local knowledge to manage resources, a proposal should be developed. Moreover, it was agreed that the proposal should be based on the symposium discussions and circulated to all participants within two months so as to allow opportunities for discussion within the participants' organisations.

The draft proposal is presented in this Annex. The title of the proposal is "Enhancing the use of indigenous and local knowledge in decision-making on natural resource management".

Challenges

Global changes are forcing the human societies of the Arctic to adapt rapidly to changing conditions that are affecting their cultural, physical and economic activities, including their all-important hunting, herding and fishing activities. At the same time, industrial development, globalization, and the use of some living resources beyond sustainable limits are continuing to represent a threat to the livelihoods, health and culture of these people, as well as some Arctic wildlife species.

Local Communities have Great Insight into Arctic Living Resources

Arctic hunters, herders and fishers have in-depth knowledge of the natural resources. It has long been a priority of several governments and the Arctic Council to strengthen the use of community-based approaches to documentation and management of natural resources, yet progress on the ground has been limited.

Constraints to Evidence-Based Management of Living Resources

Most efforts to look after living resources in the Arctic have focused on scientist-executed methods and “externally-driven” approaches. In these approaches, professional researchers from outside the area set up, run and analyse the results from a natural resource monitoring scheme. Scientist-executed monitoring is often technically and logistically demanding. As a result, scientists often stay in the area only a short time, typically when the game species are breeding, whereas hunters, herders and fishers live in and experience the area year round. “Externally-driven” monitoring, moreover, sometimes pays inadequate attention to the objectives of other key stakeholders besides professional natural resource managers – especially indigenous and other local communities whose livelihoods are often closely impacted by the resources concerned. Effective evidence-based resource management is thus constrained.

Potential for Co-Production of Knowledge

In several areas, a supplementary approach is being used that builds upon already existing informal observing methods of Arctic community members. In this approach, indigenous and other local people are directly involved in data collection and interpretation, and documentation of natural resources is linked to the lives and decisions of indigenous and local people. When local stakeholders keep track of trends in resources and resource use, they increase their capacity to adapt resource management to social, political, economic, environmental and other changes. Such “locally-based documentation” can further strengthen local resource management decisions and capacities as well as relations between local resource users and relevant natural resource management authorities, thereby stimulating local action and resulting in a dynamic and adaptive resource management regime.

Together We Can Achieve More

At the moment, these efforts – on the part of many individuals and institutions – to use indigenous and local knowledge to look after and manage natural resources are being undertaken in a fragmented and piecemeal manner. There is no common approaches taken, and there is therefore a high risk of duplication of effort and wasted time and resources. Likewise, there is little exchange of experiences between those working with local knowledge for decision-making in different regions of the Arctic. The use of indigenous and local knowledge in documentation and management is not being effectively implemented in the management of Arctic living resources. This is unfortunate, as the Arctic stakeholders, from a global perspective, possess important experiences with regard to

documenting and managing resources. Moreover, the potential for significantly scaling up and extending existing experiences across the world is not being utilized.

Proposed Partnership

It is proposed to establish a partnership of organisations and institutions involved in co-producing knowledge for improved decision-making on natural resource management. The partnership will support different key initiatives related to the participatory documentation and management of Arctic living resources. It will rely on the willingness of the participating organisations and institutions to pool their expertise and resources in order to fulfil the purpose of the partnership. A coordination mechanism will be established to ensure regular exchange between the partners and open participation in these processes. The partnership will include many different types of activity on co-producing knowledge for resource management, and partners with specific expertise will be identified to take a leading role in driving specific partnership activities forward. The partnership will encourage a strong commitment on the part of those involved and will thus be driven from the bottom up by dedicated partners.

Funding

To enable the establishment and operation of this partnership, it is proposed to raise funds for four years of the partnership's activities from potential financial partners.

Objectives and Activities

The partnership's proposed long-term objective is as follows: To achieve sustainable livelihoods from an enhanced use of indigenous and local knowledge in natural resource decision-making. The partnership will contribute to achieving this objective by: (1) supporting specific interventions, (2) capacity building and education, (3) communication, and (4) learning from practice. There is today no other initiative with this objective that undertakes these activities. The detailed objectives and activities are described below.

- *Supporting specific interventions*

Objective: Community members will increasingly mobilize and document their knowledge for informed decision-making on natural resource management.

Activities: The partnership will, through concrete actions, ensure and enhance community-to-community experience exchange on the use of indigenous and local knowledge to manage natural resources in a range of communities across the Arctic countries, using – where it is relevant – social networks with language-translation facilities and other tools. The specific activities will be adjusted to the local context in each country and community.

- *Capacity building and education*

Objective: Natural resource management institutions and decision-makers in government and civil society will be capable of increasingly drawing on indigenous, local and scientific knowledge to manage natural resources.

Activities: The partnership will strengthen the capability of local, municipal and national natural resource management institutions to use indigenous and local knowledge to manage Arctic resources. The partnership will facilitate the development and dissemination of training and training-of-trainers materials in the co-production of natural resource knowledge. Moreover, the partnership will build the capacity of managers, decision-makers and leaders in government and civil society in how to improve collaboration with indigenous communities and institutions to engage indigenous, local and scientific knowledge for improving natural resource decision-making and governance.

- *Communication*

Objective: The general status of indigenous and local knowledge on natural resources will be elevated.

Activities: The partnership will communicate experiences of using indigenous and local knowledge to document and manage natural resources through undertaking or supporting information activities and workshops targeted at both international, regional (Arctic), national and community-level stakeholders. For instance, the partnership may support a “think tank” of 8–10 indigenous peoples’ leaders and politicians with insight into natural resource management. The individuals will meet annually to evaluate the progress in elevating the general status of this field and to facilitate the incorporation of the experiences into development, climate and environment policies and efforts.

- *Learning from practice*

Objective: Successful experiences of using indigenous and local knowledge in natural resource decision-making will be documented and widely shared.

Activities: The partnership will ensure that the methods and approaches for connecting indigenous, local and scientific knowledge to inform natural resource decision-making are made universally applicable, rigorously tested and disseminated internationally.

Reindeer husbandry on Kanin Peninsula, Arctic Russia



Photo: F. Danielsen.

Organisation

The partnership will consist of local partners in each country who will develop and implement a common work plan and joint activities that are supported technically, financially and administratively by a secretariat. Partners with specific expertise will take a lead role in driving specific partnership activities. The partnership will be supervised by a Steering Committee with representatives of Permanent Participants and Arctic government agencies responsible for the management of natural resources. Hosting of the secretariat will rotate among key Arctic partners to ensure broad participation.

Budget

External support will be required to cover community-to-community experience exchange and other specific interventions in X communities in X countries, workshops, training, communication, staff and operations. After four years, it is envisaged that methods of co-producing natural resource knowledge will have been incorporated into the policies and daily work of governments and key national and international development, climate and environment organisations.

3. Symposium programme

Day 1 – Monday 2nd December 2013 – Morning

9.30	Welcoming address by Rodion Sulyandziga, Center for Support of Indigenous Peoples of the North
9.35–9.45	Round of introduction of each participant. Name, where you come from, what you expect from this meeting
9.45–11.00	Discussion of why the use of indigenous/local knowledge to manage resources matters
11.30–13.00	Second Session. Governance and community monitoring
11.30–11.40	Governance and community monitoring – experiences from Russia by Rodion Sulyandziga
11.40–11.50	How increased international cooperation can contribute to the objectives of CAFF-CBMP by Kári Lárusson of Conservation of Arctic Flora and Fauna
11.50–12.00	Governance and community monitoring – Pisuna experiences from Greenland by PáviáraK Jakobsen, Qaasuitsup Municipality, and Nette Levermann, Ministry of Fisheries, Hunting and Agriculture
12.00–12.10	Governance and community monitoring – experiences from Sweden by Sune Sohlberg, Naturvårdsverket
12.10–13.00	Questions and answers
13:00–14.00	<i>Lunch</i>

Day 1 – Monday 2nd December 2013 – Afternoon

	Third Session. Governance and community monitoring (continued)
14.00–14.30	Community-based approaches for documentation and management of natural resources – an attempt at providing an overview, by Finn Danielsen, Nordic Foundation for Development and Ecology, Greenland/Denmark
14.30–14.40	Governance and community monitoring – experiences from Finland, Murmansk and Siberia by Tero Mustonen, SnowChange
14.40–14.50	Experiences of the International Reindeer Herders Association and the International Centre for Reindeer Husbandry by Ravdna Eira and Svein D. Mathiesen, Kautokeino
14.50–15.00	Supporting the development of community monitoring networks by Noor Johnson, Brown University, Canada/USA
15.00–16.00	Questions and answers
16.00–17.15	Discussion in plenum Discussion to establish a Eurasian or international network on the use of indigenous and local knowledge to manage resources. Several participants want to go ahead and develop this. Who wants to be part of this? Where will the specific sites be?
17.15–17.30	Wrap-up from Day 1
17.30–evening	Write-shop. Addressing gaps in the atlas of community monitoring schemes in the European Arctic

Day 2 – Tuesday 3rd December 2013 – Morning

8.30	Fourth Session. Connecting knowledge systems.
9.00–9.15	Summary from Day 1
9.15–9.25	Experiences from industrial development in Greenland by Augusta Jerimiassen of Greenland Fishers and Hunters Association (KNAPK) and Bjarne Lyberth of ICC-Greenland
9.25–9.35	Experiences from Sweden by Weronika Axelsson Linkowski, Naptek, Swedish Biodiversity Centre, Swedish University of Agricultural Sciences
9.35–9.45	Connecting knowledge systems in Panarctic reporting: Lessons from the <i>Arctic Biodiversity Assessment</i> by Tero Mustonen, SnowChange, Finland
9.45–9.55	Connecting knowledge systems in Panarctic reporting: Lessons from the <i>Arctic Human Development Report II</i> by Peter Sköld, Umeaa University, Sweden
9.55–10.05	Connecting knowledge systems in global science-policy processes by Maria Tengö of Stockholm Resilience Centre
10.05–10.30	Questions and answers

Day 2 – Tuesday 3rd December 2013 – Midday and afternoon

11.00–16.00	Fifth Session. Discussion in plenum
11.00–13.00	Discussion Question: 1. What kind of strengthened cooperation is needed?
13.00–13.30	<i>Lunch</i>
13.30–15.45	Discussion continued. Questions: 2. What approaches seem the most productive and promising? 3. How do we build durable programs? 4. How do we enhance the stature of this area of work and its practitioners? 5. How can indigenous/local knowledge help change resource management?
15.45–16.00	Wrap-up
19.00–21.30	<i>Symposium dinner.</i>

4. List of participants

This annex comprises a list of the people that participated in the symposium.

- Alona Yefimenko, Indigenous Peoples Secretariat of Arctic Council
- Augusta Maria Jerimiassen, Greenland Hunters and Fishers Association, Greenland
- Bjarne Lyberth, Inuit Circumpolar Council-Greenland, Greenland
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- Finn Danielsen, Nordic Foundation for Development and Ecology
- Galina Platova, Yasavey Association of Reindeer Herders, Naryan Mar, Russia
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- Maria Tengö, Stockholm Resilience Centre, Sweden
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- Yulia Baramokhina, Indiga Community Monitoring Group, Nenets Autonomous Okrug, Russia
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5. Заключение и выводы

Summary in Russian

Гренландское Министерство по рыболовству, охоте и сельскому хозяйству, проект ELOKA и Северный Фонд развития и экологии организовал симпозиум по использованию знаний коренного и местного населения по управлению ресурсами. Симпозиум состоялся в Копенгагене, с 2 по 3 декабря 2013 года, при этом среди участников были штатные сотрудники, специалисты гражданского общества и государственных органов с опытом работы в этой области в Арктике. Основными целями являлись определение общего опыта, проблем, возможностей и стратегических подходов и таким образом требовалось выяснить, проведение каких мероприятий необходимо между основными заинтересованными сторонами, для увеличения совокупного влияния и усилий по использованию знаний коренного и местного населения для документирования и управления ресурсами в Арктике.

5.1 Опыт

Участники отметили богатый опыт использования знаний коренного и местного населения в области управления ресурсами. Основные положения включали:

- Лица, принимающие решения в сфере органов управления природными ресурсами часто имеют ограниченные контакты как с реальными событиями на местах, так и со знаниями коренных народов. Знания коренного населения по управлению ресурсами тесно связаны с интересами в управлении ресурсами на местах. Взаимодополняющая связь между системами коренных/местных и научных знаний очень важна; внимание к этому может содействовать использованию знаний коренного и местного населения на различных уровнях принятия решений.

- знания коренного и местного населения способствуют получению информации, необходимой для устойчивого управления природными ресурсами в Арктике. Они используются на местах, но недостаточно широко, чтобы всеобъемлюще влиять на принятие решений по управлению природными ресурсами в Арктике.
- Информация, основанная на знаниях коренных народов различается от мониторинга на уровне общин, который заключается не только в сборе данных и наблюдений, но и в ведении процесса вовлечения общин, образования и передачи знаний. Документирование природных ресурсов на уровне общин может стать важным инструментом, который позволит общинам укрепить свой голос в принятии региональных и корпоративных решений путем информирования своих собственных лидеров полученными наблюдениями и знаниями
- знания коренных народов истолковываются оленеводами, как очень практичные, и поддающиеся проверке и тестированию. Им, тем не менее, приходится много работать с демократическими системами, чтобы их знания воспринимались всерьез. Совместные встречи и общение охотников и рыбаков на тему природных ресурсов и их использования могут принести очень полезные возможности в плане обмена знаниями.
- Для того, чтобы эффективно соединить знания коренного, местного населения и знаний научного общества требуется время, усилие и взаимопонимание. Надо себе четко представлять цели и действия. Конечный продукт однако зачастую представляется большим, чем сумма каждого действия.

5.2 Проблемы

Общие проблемы, выявленные участниками:

- Реальность такова, что существуют две различные системы знаний. Знания местного и коренного населения не оцениваются в той же мере, что и научные знания. Многие коренные народы просто пытаются выжить и добыть себе пропитание; у них нет времени на обдумывание своих знаний или их будущего. Быстрое развитие промышленности в Арктике, однако, заставляет коренных и местных жителей сотрудничать друг с другом и в связи с этим договариваться о путях продвижения вперед в отношении использования знаний коренного и местного населения в управлении природными ресурсами.
- Местные жители владеют огромным количеством данных и опытом, но как правило все эти необходимые знания не документируются органами управления природными ресурсами.
- Особые проблемы включают вопрос масштабности. Иногда информация, истекающая из знаний коренных и местных народов и используемая в ходе экологических оценок, основана на наблюдениях одного человека и из одной местности, в то время как выводы ученых охватывают большие площади. С другой стороны, научные исследования, как правило, проводятся в короткие сроки и в небольшом географическом масштабе. Они могут иметь ограниченные возможности в обобщении более широких областей и более длительного промежутка времени. Знания коренного и местного населения, с другой стороны, зачастую охватывают знания обширных территорий и более длительного периода и, следовательно, могут быть наиболее полезными для принятия решений.
- Существует ограниченный обмен опытом и наличие компетентности различных усилий, в совместной работе с различными типами систем знаний для того чтобы направлять управление природными ресурсами.

Skinning of reindeer on the tundra, Nenets Autonomous Okrug, Russia



Photo: M. Enghoff.

5.3 Возможности

Некоторые из основных возможностей, выделенных участниками:

- с местной точки зрения, существует огромный интерес к тому, чтобы услышать о том, что происходит в местных поселениях и возможности высказаться самому. Существует, например, большая потребность в том, чтобы узнать из воспоминаний о том, как люди справлялись с неопределенностью и неожиданными событиями. До сих пор существующие знания местного и коренного населения являются одним из основополагающих активов по заботе и рациональному использованию природных ресурсов: это знание необходимо уважать и сохранять для будущего. Было отмечено несколькими участниками, что совместное производство знаний для управления ресурсами может содействовать созданию правил наиболее ориентированных на развитие и применение в местных условиях. Установленные, за пределами региона, правила менее актуальны на местном уровне.

- Важно иметь на местах муниципальный и другой государственный персонал, который бы принимал меры по поступившим предложениям от тех общин, которые документируют свои наблюдения и знания природных ресурсов и их использование.
- знания коренных народов/знания местных жителей и научные знания имеют свои собственные системы проверки информации. Системы знаний коренных и местных жителей имеют потенциал предоставления информации, которая является одновременно надежным и актуальным для информирования процесса принятия решений по управлению природными ресурсами.
- сами коренные народы и местные жители, но не ученые, должны формировать совместные инициативы и определять, каким образом и где будут участвовать ученые и члены общины.
- Несколько международных соглашений поддерживают наведение мостов между знаниями коренных народов, местных жителей и научных знаний во имя управления природными ресурсами. Межправительственная научно-политическая платформа по биоразнообразию и экосистемным услугам (IPBES) имеет 116 государств-членов, в том числе все арктические государства, за исключением Исландии. Одной из ее функций является приведение различных систем знаний, в том числе систем знаний коренных народов и местных знаний, в научно-политическое взаимодействие. Кроме того, Конвенция о биологическом разнообразии (КБР) имеет статьи, которые подчеркивают важность знаний коренного и местного населения.

5.4 Ответы

Участники обнаружили, что местные знания и знания коренных народов должны быть далее интегрированы в процессы по принятию решений по управлению ресурсами на всех уровнях. Должны быть определены пути тесного сотрудничества для заинтересованных сторон, участвующих в принятии решений по природным ресурсам, но это сотрудничество должно строиться на основе прагматического подхода и с точки зрения равных перспектив. Ключевым компонентом успешного соединения систем знаний является честный диалог между главными партнерами, в

котором каждый чувствует себя одинаково комфортно. Где есть уважение к знаниям, системам знаний и их носителям.

Был сделан вывод, что для того, чтобы укрепить обмен опытом от сообщества-сообществу и другие мероприятия по сотрудничеству в области использования знаний коренного и местного населения по управлению ресурсами, должно быть разработано предложение. Предложение должно быть представлено и обсуждено на семинаре «Глобальное изменение, системы наблюдения коренных народов на уровне общин и совместное производство знаний для Приполярного Севера», организованном Международным центром оленеводства, ЮНЕСКО и другими партнерами в Каутокейно 25 – 27 марта 2014. Кроме того, было решено, что предложение должно быть составлено на основе обсуждений симпозиума и распространено среди участников в преддверии семинара в Каутокейно. Предложение можно затем далее разработать и пересмотреть там же с теми организациями и частными лицами, которые будут в этом заинтересованы.

6. Dansk sammenfatning

Klimaet ændrer sig, og befolkningen i Arktis står overfor store udfordringer. Mange er afhængige af de levende ressourcer som levebrød og indtægtskilde. Succesfuld tilpasning til klimaændringer og bæredygtig udnyttelse af de levende ressourcer kræver observationer af miljøet. Videnskabelig viden om miljøet er ufuldstændig, og konventionel forskerbaseret miljøovervågning er logistisk vanskelig. Lokale fiskere, jægere og andre naturinteresserede observerer naturen hele året rundt. Deres iagttagelser og viden bliver imidlertid ikke systematisk anvendt i den politiske proces om forvaltning af de levende ressourcer.

Den grønlandske regering har derfor taget initiativ til et symposium for at drøfte erfaringerne med brug af oprindelige folks og lokales viden til at dokumentere og forvalte de levende ressourcer i Arktis. Mødet fandt sted i København den 2.–3. december 2013. Der deltog fagfolk og ressourcepersoner fra organisationer og myndigheder i alle de arktiske lande. Resultaterne af mødet er samlet i denne rapport.

Der findes flere forskellige former for viden. Videnskabelig viden er værdsat i brede kredse, mens de lokales viden ikke er det. Myndigheder og beslutningstagere i Arktis har undertiden begrænset kontakt med den lokale virkelighed og de lokales viden.

I mange bygder findes der mennesker med betydelig indsigt og viden om ressourcerne. De mangler imidlertid ofte de redskaber, der skal til, for at dokumentere og kommunikere deres viden til beslutningstagerne. De lokale og oprindelige folk kan bidrage med oplysninger, der kan fremme en bæredygtig forvaltning af de levende ressourcer. Lokalt-baseret dokumentation af de levende ressourcer kan samtidig være en vigtig mekanisme, der kan give lokalsamfund en "stemme" i de lokale og nationale beslutningsprocesser om de levende ressourcer. Hidtil har der kun været begrænset udveksling af erfaringer og kompetenceopbygning på tværs af projekter om lokal og oprindelige folks viden.

De lokales og oprindelige folks viden og observationer kan både være pålidelige og relevante for forvaltning af de levende ressourcer. Fra lokalt hold er der stor interesse for at blive "lyttet" til og for at få indflydelse på, hvad der sker i omgivelserne. Øget anvendelse af lokales og oprindelige folks viden og observationer kan fremme, at lovgivning og regler bliver lokalt relevante og omsat til virkelighed. Flere internationale aftaler støt-

ter op om brug af de lokales viden til naturforvaltning. Det drejer sig bl.a. om Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES) og Konventionen om Biologisk Mangfoldighed.

De lokales og oprindelige folks viden og iagttagelser bør indgå i beslutningsprocesser om forvaltning af de levende ressourcer både på lokalt, nationalt og regionalt (arktisk) niveau. Der er behov for at styrke udveksling af erfaringer mellem de arktiske bygder for at fremme brug af de lokales og oprindelige folks viden i den demokratiske politiske proces om forvaltning af de levende ressourcer.

7. Eqikkaaneq

Grønlandsk sammenfatning

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najukkami inuiaqatigiinnik najukkani nunalu tamakkerlugu pisuussutit uumassusillit pillugit aalajangiinerni "sunneeqataaffiusinnaasoq". Najukkani ilisimasat nunallu inuiisa ilisimasaat pillugit suliniutit akornanni misilittakkanik piginnaasanillu annertusaanermik killiliinnarmik avitse-qatigiittoqartarsimavoq.

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Najukkami innuttaasut nunallu inuiisa ilisimasaat takusaallu najukkami, nuna tamakkerlugu nunallu immikkoortuini (issittumi) pisuussutit uumassusilinnik aqutsineq pillugu aalajangiinernut ilaatinneqartariaqarput. Najukkami innuttaasut nunallu inuiisa ilisimasaasa pisuussutit uumassusilinnik aqutsineq pillugu oqartussaaqataanikkut politikikkut sulinermit atorineqarnerat siuarsarniarlugu issittumi nunaqarfiit akornanni misilittakkanik avitseqatigiittoqarnerusariaqarpoq.



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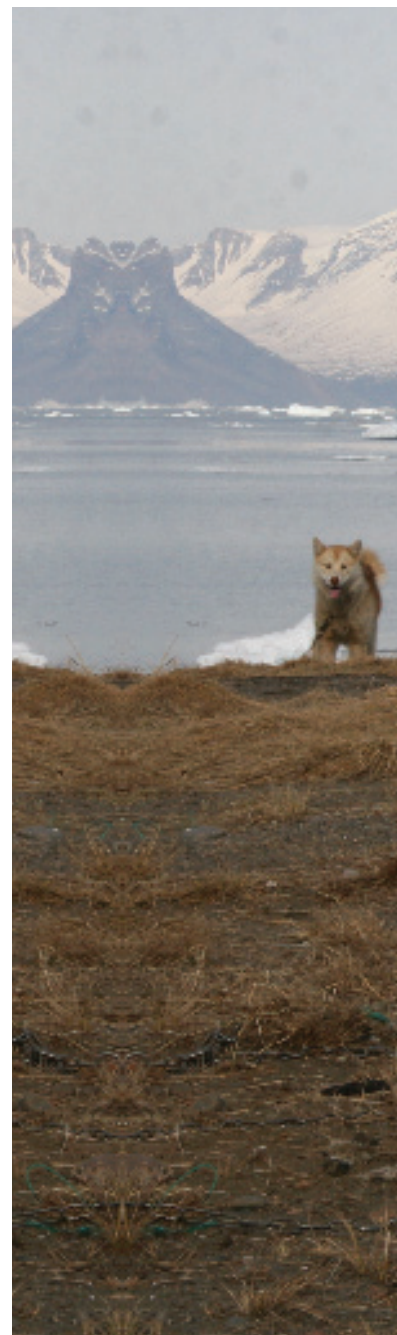
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TemaNord 2015:506

Local knowledge and resource management

The climate is changing, and the people in the Arctic are facing huge challenges. Many rely on natural resources for both subsistence and income. Successful adaptation to climate change and the sustainable use of resources require observation of the environment. Scientific knowledge of the environment is incomplete, and conventional scientific monitoring is logistically difficult. Arctic citizens observe the environment all year-round. Their observations and knowledge are, however, not systematically used in the political decision process. An international symposium was therefore organized to encourage Arctic cooperation, and to exchange experiences, on the use of citizens' knowledge and observations to document natural resources and inform the political process. The meeting drew participants from all the Arctic countries. Their discussions and conclusions are presented in this report.



TemaNord 2015:506
ISBN 978-92-893-3921-6 (PRINT)
ISBN 978-92-893-3923-0 (PDF)
ISBN 978-92-893-3922-3 (EPUB)
ISSN 0908-6692

