Towards "good practice" in the use of local and scientific knowledge for informing natural resource management

Report from workshop
Aasiaat - Greenland
29 November – 1 December 2022

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Content

Acronyms

AAOKH - Alaska Arctic Observatory & Knowledge Hub
AEWC - Alaska Eskimo Whaling Commission
AMAP - Arctic Monitoring and Assessment Programme
APN - Aalisarnermut Piniarnermullu Nakkutilliisoqarfik
APS - Arctic Practice System
CAPARDUS - Capacity building in Arctic Standardization Development
CBM - Community-Based Monitoring
CCI - Consumer Confidence Index
CPUE - Catch Per Unit Effort
CS - Citizen Science
DCE - Danish Centre for Environment and Energy
FPIC - Free, Prior and Informed Consent
GEUS - Geological Survey of Denmark and Greenland
GFLK - Greenland Fishery License Control
GINR - Greenland Institute of Natural Resources
GO - Governmental Organization
IAPP - Ilulissani Aalisartut Peqatigiiffiat
ILK - Indigenous and Local Knowledge
INTERACT - International Network for Terrestrial Research and Monitoring in the Arctic
IPLC - Indigenous Peoples and Local Communities
KNAPK - Kalaallit Nunaanni Aalisartut Piniartullu Kattuffiat - The Association of Fishers & Hunters in Greenland
LULI - Licenser, Ugemeldinger, Logbøger og Indhandlinger (governmental fisheries database)
MSC - Marine Stewardship Council
NAFO - Northwest Atlantic Fisheries Organization
NAMMCO - North Atlantic Marine Mammal Commission
NINA - Norwegian Institute for Nature Research
NGO - Non-Governmental Organization
PISUNA - Piniakkanik Sumiiffinni Nalunaarsuineq (Opening Doors to Native Knowledge)
SIZONet - Seasonal Ice Zone Observing Network
SQAPK - Sinerissap Qanittuani Aalisartut Piniartullu Kattuffiat – The Organization in Near Coast Greenland for Fishermen and Hunters
UArctic - University of the Arctic

Participants at the workshop in Forsamlingshuset, Aasiaat

Back row from left: Dennis Bidstrup, Rasmus Lindholm, Palle Smedegaard Nielsen, Parnuna Egede Dahl, Joachim Christensen, Finn Danielsen, Birger Poppel, Herizo Andrianandrasana, Gerth Nielsen, Vivianne Mazzocco.

Center row from left: Per Ole Frederiksen, Karl Tobiassen, Søren Stach Nielsen, Rasmus Nygaard, Martin Enghoff, PâviâraK Jakobsen, Steen Christensen, Braulio Dias, Jørgen Isak Olsen, Karl S Marcussen, Rannvá Clementsen, Elmer Topp-Jørgensen, Hans Inûsugtoq, Inuuteq Bidstrup.

Front row from left: Nikkulaat Jeremiassen, Amalie Jessen, Yuka Oishi, Tida Ravn.
Not shown: Pauline L. Abelsen, Robin Holmvang, Jessica Lefevre, Roel May, Johan Nielsen, Ina Olsen, Michael Køie Poulsen

Background

This report documents a workshop convened from 29 November – 1 December 2022 in Forsamlingshuset, Aasiaat, Greenland. The purpose of this report is to summarize the discussions and conclusions of the workshop. The workshop was organized with the following objectives:

- Review the future for how local knowledge can help to inform decision-making on natural resources, and explore how the financial and organizational sustainability of Community-Based Monitoring (CBM) programmes can be assured, and how CBM and scientific observations can be connected

- Work towards developing global 'good practice' guidelines in CBM and management of natural resources

- Test a software tool that can guide decision-making in complex social-ecological systems with limited scientific data but substantial local knowledge

- Discuss how an Arctic Practice System (APS) should be connected to CBM/Citizen Science (CS) systems – and what the benefit would be

The workshop was funded by the European Union's Horizon 2020 research and innovation programme through the CAPARDUS project under grant agreement No 869673, and by the Danish Agency for Science and Higher Education through the UArctic Thematic Network on Collaborative Resource Management.

CAPARDUS is a Horizon 2020 project with a focus on developing guidelines and standards in research, resource exploitation and management, shipping, tourism and community planning in the Arctic. The project contributes to developing, demonstrating, and widely circulating good practices. The project involves scientists, economic actors, local communities, managers and regulators. Workshops and dialogue meetings are used to discuss how socio-environmental systems are changing Arctic communities.

Climate change and its consequences in the Arctic is resulting in new requirements for planning and decision-making based on scientific and economic data, assessments and predictions. One prerequisite for good planning is access to data and information of relevance to people living and working in the Arctic. CBM and Citizen Science (CS) initiatives are evolving across the Arctic, providing complementary data to the scientific observing systems. CBM/CS systems are initiated by people who need specific environmental and climate information to support resource management, local decision-making and the safety of human activities. An example is the PISUNA programme (Piniakkanik Sumiiffinni Nalunaarsuineq; https://www.pisuna.org/, https://eloka-arctic.org/pisuna-net/en). The challenges facing CBM and CS projects in the Arctic are largely to: (1) develop CBM/CS systems from ad hoc initiatives into sustainable observing systems, (2) connect CBM/CS and scientific observations, (3) make use of CBM/CS data in decision-making, and (4) establish sustained funding.

Dry fish and sledge dogs in Niaqornaarsuk settlement, Disko Bay

Summary

Late 2022, the EU CAPARDUS project and the UArctic Thematic Network on Collaborative Resource Management organized a workshop on the use of local and scientific knowledge for informing resource management. The workshop was held in Forsamlingshuset in Aasiaat on the shoreline of Disko Bay, Greenland, from 29 November to 1 December 2022. The participants were fishers and hunters, public decision-makers, natural resource managers, representatives of civil society associations, and social and natural scientists. The main objectives were to review the future to see how local knowledge can contribute to informing decision-making on natural resources, and to explore how the financial and organizational sustainability of Community-Based Monitoring (CBM) programmes can be assured and how CBM and scientific observations can be connected. The workshop was thereby working towards the development of global 'good practice' guidelines in community-based monitoring and the management of natural resources.

Amalie Jessen, Ministry of Fisheries and Hunting, APN Hunting and Karl Tobiassen, Minister of Fisheries and Hunting.

Per Ole Frederiksen, PISUNA in Attu and Nikkulaat Jeremiassen, KNAPK.

There was agreement on several topics at the workshop:
1) That pilot initiatives whereby fishers and hunters in Greenland have followed the status and trends of the living resources and shared this knowledge with decision-makers have provided useful experiences.
2) That these pilot initiatives should be continued and further organized and scaled up, and that they should be supported by legislation.
3) That a systematic approach should be established to connect user knowledge with conventional scientific knowledge to inform decision-making.
4) That financial means should be secured for the fishers and hunters who are engaged in this work, and for the organizational framework for their work.

Moreover, it was decided at the workshop to set up a working group to support the involvement of user knowledge in resource management in Greenland "The Working Group for Action on the Involvement of User Knowledge in Resource Management in Greenland". It was also decided to jointly update the "Manaus Letter: Recommendations for the Participatory Monitoring

of Biodiversity" in the coming months. Finally, the conclusions from the workshop were sent to the Secretariat of the Convention on Biological Diversity to inform the discussions on the new global agreement, the Kunming-Montreal Global Biodiversity Framework. All the presentations at the workshop are publicly available at this link. The workshop was funded by the EU's Horizon 2020 research and innovation programme and by UArctic through the Danish Agency for Science and Higher Education.

1. Proceedings

The following summarizes the presentations and discussions at the workshop. To aid quick reference, some of the key points raised during the meeting are highlighted as quotes.

The workshop opened with a welcome speech by the Mayor of Qeqertalik Municipality.
A transcript of the speech follows here.

Ane Hansen (Mayor, Qeqertalik Municipality)
Dear guests from different countries who are working with the use of participatory monitoring and management of living resources, whether you have an academic background or volunteer-based interest.

I would like to particularly welcome the Minister of Fisheries and Hunting, Karl Tobiassen, and his staff. And the key leaders of this seminar: the staff of PISUNA (Piniakkanik Sumiiffinni Nalunaarsuineq) in Attu. A warm welcome to the Municipality of Qeqertalik!

In Aasiaat, our community does not lack natural resources - be it animals or other natural resources. During the summer we experience and see almost all species of whale in our area. Right now, it is beluga and narwhal season. Almost all the export fish of this country are fish that are fished from our region. One of the biggest bird colonies in the world is in our municipality. And land-based animals such as the caribou and muskox have large areas of feeding ground. The people here therefore have a high interest in a sustainable use of the living animal resources. And they see the impact of the climatic changes.


Karl Tobiassen, Minister of Fisheries and Hunting

Economic income in Greenland is primarily based on fishery. And being able to have a livelihood, providing ourselves with natural resources, is critical to us in our everyday lives. That is why the Greenland Institute of Natural Resources (GINR) - and the scientific work they do - is key to our government and the work they do. Despite this, there has been an ongoing dispute between hunters and fishers and the scientific representatives, in scientific

works. And the dispute is ongoing. In my time as Minister of Fisheries, Hunting and Agriculture from 2009-2013, I supported the work of PISUNA, and the reports documenting trends observed during fishery and hunting - and proposing management actions. This is because I believe that it is important in these fields, that you "open up the doors" to Indigenous Peoples' knowledge, and scientific knowledge. I believe collaborating in participatory monitoring is important. I believe that sharing knowledge amongst each other is beneficial for all parties.

There are nine communities from our area who have been involved in the participatory monitoring work, because there is a clear interest and support from the government. But unfortunately, there is now only one community left who are actively participating. And that is the hunters and fishers of Attu, who are still tirelessly interested and are still keeping up the work. And they were nominated for, and won, the Nordic Council Environment Prize in 2018 for this work, which we were all very proud to witness.

Therefore, it is my hope that PISUNA will once again be clearly supported from the government, so the work of including the Indigenous people's knowledge can be integrated beneficially in ongoing scientific work in the future. We in the Municipality of Qeqertalik support this work. And therefore, we encourage the Minister to clarify the support from the government as well.

"...it is my hope that PISUNA will once again be clearly supported..."

And with this, a heartfelt welcome to all of the participants from all over the world to this seminar, and I hope for you a fruitful outcome!

The welcome speech by Ane Hansen was followed by a speech by the Minister of Fisheries and Hunting (since April 2022). A transcript of the speech follows here.

Karl Tobiassen (Minister of Fisheries and Hunting)
Dear participants, organizers and Mayor of Qeqertalik Municipality. It is a great pleasure for me to participate in the workshop because I, as a hunter, participated in the start of the PISUNA project in the Uummannaq area and I think it was and continues to be an important area. An area that I hope this seminar can strengthen, giving us tools for improvement in the future.

I am fully aware that hunter and user knowledge can enrich us all in the overall knowledge of wild animals and their habitats. We can do this by establishing the necessary legislative framework so we can achieve a structured and organized collection and sharing of knowledge.

"...hunter and user knowledge can enrich us all"

Hunter and user knowledge should weigh as much as scientific knowledge. Unfortunately, this

is not the case today, as I think there is an imbalance in that science is valued more than hunter and user knowledge when decisions have to be made.

I have therefore continued what my predecessors started in the proposal for a Hunting Act to clarify the legislative framework for the structured and organized collection, sharing and use of hunter and user knowledge. The proposed law was unfortunately postponed for consideration until the Spring Parliamentary session in 2023. I look forward to getting the framework in place.

The department has also initiated the drafting of a executive order on the collection, use and sharing of hunter and user knowledge so that this can be sent for consultation as soon as the draft law is approved in the Greenlandic Parliament, Inatsisartut. We know very well that there can be major and irreconcilable disagreements between scientists and hunters about e.g. number of wild animals in certain areas and the production of young.

In the draft of the law, I have proposed that, in hunting, emphasis must be placed on the inclusion of hunter and user knowledge in the regulation of hunting. In the same way as for fishing, this must be done taking into account the overall principles of sustainability both nationally and internationally, socio-economic benefit and appropriate distribution between commercial and recreational use.

The provision also gives the government, Naalakkersuisut, the authority to lay down detailed rules in, for example, an executive order on the inclusion of hunter and user knowledge in connection with the administration of the law. This could be, e.g., in

an executive order concerning the Council of Hunting or more detailed rules on the collection, use and management of hunter and user information. Through the initiative to give authority, via the Hunting Act, for an executive order on structured and organized collection, the use and sharing of hunter and user knowledge will carry as much weight as scientific knowledge in the decision-making process.

Finally, I would encourage future efforts to focus more on how we can minimize the challenges and focus more on the opportunities for both fields of knowledge to cooperate and benefit more from each other. I thank you for the invitation and wish you a constructive and good workshop.

Representatives of the different authorities had previously been asked to talk on the following questions: How do you see the future for local knowledge in terms of informing decision-making on natural resources in Greenland: Should local knowledge be further used for informing decision-making? How?

Amalie Jessen (Ministry of Fisheries and Hunting; APN Hunting).
Hunters' and users' knowledge should inform decision-making, in accordance with the law. Use of hunter and user knowledge is based on § 2, subsection 3 and 4 of the Inatsisartut law on hunting. Emphasis must be placed on including hunter and user knowledge gained through, among other things, the main organizations involved and the Hunting Council. There are structured and organized consultation processes in place. The Ministry of Fisheries and Hunting creates the formal framework and KNAPK provides this user knowledge.

There is a clear need to redress the imbalance in the use of scientific knowledge / advice and hunter and user knowledge in connection with the decision-making processes. A new law will be debated in parliament next year and it is the intention that more hunter/user knowledge will be used. Work is underway on a new executive order on the collection and use of hunter and user knowledge, which will set a framework for the organized and structured collection and use of hunter and user knowledge. There is a need for a clearer framework for the collection and use of hunter and user knowledge. Systematic and organized collection of hunter and user knowledge at local level ensures a more solid decision-making basis for decision-makers at local and national level.

"... need for a clearer framework for the collection and use of hunter and user knowledge."

There are challenges, as can be seen with the serious disagreement on the status of narwhal in East Greenland and how often they reproduce. Hunters have important knowledge; e.g. they can draw migration routes of narwhal on a map. We need to balance hunter and user knowledge and scientific knowledge, especially on whales inc. narwhal. There are several hearing

processes. Hearing processes give hunters and users the opportunity to recount what they have observed although this rarely occurs.

There is also a question of finances. The costs of reporting on this collaboration between hunters/users, scientists and the authorities need to be clarified. We do not have the resources to look at these proposals. More funding is needed, as is better coordination. With regard to economic sustainability, at the local level, the Municipal Board should, in close cooperation with KNAPPs or similar associations, determine how any financial aspects can be ensured. APN has no direct influence there, but encourages it. APN creates the formal framework via legislation – it does not have financial capacity but can contribute in kind.

We need a reporting system – same for all animals and for the whole of Greenland. Covid-19 stopped the creation of more Attu groups. Volunteers can continue if they want: don't wait for the authorities but don't expect payment. We spend too much time on the differences between hunter and user knowledge and scientific knowledge. Scientists do one count in one spot at one time. Hunters/users are present all year round so their contribution is important.

Robin Holmvang (APN Fisheries)
Regarding Citizen Science in Greenland and the use of local knowledge in the management of fisheries, how will we use citizen science and local knowledge? We already use fishers' knowledge. The current use is by indirect application. The continued use of citizen science, and local knowledge as part of citizen science, depends on administrative efforts and on finding ways to bridge the gap between science and local knowledge. The challenge of citizen science is that of connecting it with scientific data. We know that local knowledge needs to be used for the management of the Central Arctic Ocean but I am not aware of this having been done.

"…finding ways to bridge the gap between science and local knowledge"

Jessica Lefevre: Can you tell us how APN Fisheries integrates Indigenous Knowledge?
Robin Holmvang: We include all stakeholders, both Royal Greenland and local fishers.

Rannvá Clementsen and Rasmus Lindholm (Mineral License and Safety Authority)
The Mineral License and Safety Authority is under the Ministry of Mineral Resources and Justice. We are a one-door authority meaning that people contacting us use just one entry point. We take care of 150+ consultations annually, such as applications for exploration licenses.

There is local involvement from an early stage. The first stages of the process include consultation with the authorities, e.g. the Municipality, while public consultation happens later. In the future, we will have public consultations earlier, from the very first application for exploration. Exploration licenses need public consultation. The responses are collected and forwarded to the Minister for approval. The final decision is at the political level.

Steen Christensen (Environmental Agency for Mineral Resource Activities)
The Agency for Mineral Resource Activities, under the Ministry of Agriculture, Self-Sufficiency, Energy and Environment, is a small agency of five persons. We collaborate with the Greenland Institute of Natural Resources (GINR), the Danish Centre for Environment and Energy (DCE) and the Geological Survey of Denmark and Greenland (GEUS).

We take knowledge-based decisions from scientific knowledge sources (publications, databases, guidelines and best

practices) and some local involvement (interviews and consultation on draft reports). Local knowledge is included in the scientific research but it is not formalized. Scientists collect data not knowledge.

We take a positivist approach, and everything should be measurable. This does not include local knowledge, even if it has proved useful over generations. This is what results in the conflict between science and local knowledge. Predictions can be based on both science and previous experience but there is a key difference: the two are not using the same language. We need to find a shared approach.

"Predictions can be based on both science and previous experience"

Local involvement cannot be included once the scientific report has been written. We must start with engagement from the beginning – when the mining company first shows an interest in an area. There will be rumors, fears, and hopes. We need joint bodies established to facilitate the process. All stakeholders should be invited, and their participation funded. It is wrong for scientists to get lots of money and locals none.

Hans Inûsugtoq (Qeqertalik Municipality)
Hans presented the structure of PISUNA (Piniakkanik Sumiiffinni Nalunaarsuineq) and how it operates. He went on to explain that the hunters and fishers possess a holistic knowledge, and that this knowledge is taken seriously in Qeqertalik Municipality. Hunters are present all the time all year round. We should try to understand why PISUNA is now only active in Attu. Unfortunately, Qeqertalik Municipality has to terminate its support for PISUNA honoraria by the end of 2022 due to budget cuts.

“Hunters are there all the time all year round”

Gerth Nielsen: Hunters and fishers have to work as volunteers because there is a lack of resources – it is a challenge to find volunteers. We would like to see PISUNA succeed but it is difficult to get people to engage in CBM. I would like to see more PISUNA in communities along the coast.
Nuunoq Per Ole Frederiksen: We were promised that the municipality would support our work. Many politicians are not aware how important the collaboration between hunters and scientists is. I hope for better conditions in 2023.

Nikkulaat Jeremiassen (KNAPK, The Association of Fishers and Hunters in Greenland)
The main reason why Inuit have survived in the Arctic, and namely in Greenland, is due to the fact that our ancestors relied on their adaptation to the harsh environment and ability to survive in changing climate and temperatures. Their ability to move after game, tools and weapons to hunt were key elements for the survival of the Inuit. These elements have become important to our culture, traditions and principles, and important to our livelihood, economy and future.

There is a different level of knowledge that applies to hunting and fishing. First there are the users, for KNAPK this is fishers’ and/or hunters who spend most of their time in the environment and nature, fishing or hunting. We refer to them as users. Traditional knowledge is the accumulated knowledge that has been passed from generation to generation, used in traditional hunting (dog sled and/or qajaq hunting). Then there is local and/or regional knowledge that only applies to local communities and/or regional communities.

Inuit have adapted to living in the Arctic because of clothing, hunting, knowledge of weather patterns, ability to sew warm clothes, navigation and mobility. Life has been sustained due to their ingenuity, ability and know-how. A knowledge of weather, currents, tides, fauna, animal behavior, hunting and fishing methods, in particular, has been essential.

The transmission of this knowledge from one generation to the next is key to the survival of the Inuit. Without written materials, this transmission has been through parenting, tutoring, guidance and teaching. Some of these important lessons have become Inuit morals and ethics that apply to the sustainable use of living resources, and which have been practiced for centuries.

KNAPK therefore believe that this important knowledge needs to be applied prior to biological surveys by consulting the users themselves who have an appropriate level of knowledge. These users should be involved as stakeholders. Questions of when, where, how, with whom and how long biological surveys are to be conducted need to be asked of the proper groups. This knowledge should be incorporated at the same level as biological factfinding. There is also a question of priorities. What comes first? Economics or the protection of stocks? Where do we start? Questions of the scientific validity of findings also need to be raised.

The discussion of what comes first is easy. Consideration for the people who have here lived longest are to be considered first. This must apply in all questions dealing with use of living resources in the Arctic. No other matter is more important than the people, who have lived and survived here for the longest time. Remember this fact, when giving biological advice. For whom? For what? And, not least, why?

Climate change is a similar discussion. User knowledge, traditional knowledge and local/regional knowledge give different answers. But the universal elements remain the same regardless of where you live. Knowledge remains the same because the environment and nature have remained the same since Inuit first stepped into the Arctic. Temperatures and weather patterns

change because of human inflicted reasons. The same goes for cross-border pollution. These are new challenges that raise new questions for our livelihood.

"Every morning the hunter and fisher will look at the weather and then decide what to do. We have accumulated knowledge..."

Per Ole (Nuunoq) Frederiksen (PISUNA in Attu)
It is critical that the knowledge of resource users in our country and others must be continuously documented. It is important to continue to record user knowledge in order to inform scientists and the administration. It is not enough to obtain information from one fisher. Local knowledge is not homogeneous, and one fisher may not say the same as the next.

Unfortunately, there is a lack of funding and interest from the Greenlandic government. The documentation from the Greenland Institute of Natural Resources is very limited, and often based on data gathering that takes place at intervals of several years. We complain if the government trust the results of such limited data gathering. GINR sees no value in our observations but, for us, they are valuable. Users' knowledge needs to be continuously documented, increased and spread across the country. The users are out there every day. Since they are using the sea's resources, they are constantly monitoring nature and the living creatures.

It is these people who are the very first to experience the effects of rapid climate change on living resources. PISUNA Attu therefore believes that Naalakkersuisut and Inatsisartut must decide what role the PISUNA project, initiated by the authorities in 2009, will have in the future. PISUNA has been largely ignored by the authorities. We base this on the submission of summaries of the quarterly meetings, and how these summaries have been used. Each of our PISUNA meetings lasts at least 3 hours. Perhaps because we are rarely provided with any feedback, PISUNA Attu is the only one of the country's 70 inhabited sites that is still continuing this process. Communities in other areas have given up their work because they feel they are never heard or perhaps are not needed. We hope that Naalakkersuisut and Inatsisartut will have the desire to strengthen PISUNA and spread it around our country.

"...Communities in other areas have given up their work because they feel they are never heard"

We believe that additional grants are necessary, not least when user knowledge and scientific knowledge need to be better connected for decision-making. Just as the scientific approach must be funded, so must ours. The tools developed by PISUNA are a great help in documenting changes and proposing management interventions that can be used in decision making. But we believe that the A4-sized summary form that PISUNA uses in its documentation is no longer enough. There needs be a transition to electronic documentation because, in this way, you will be able to immediately see where in the country's regions observations have been documented. We know that this requires funding to do it. The authorities should realize that this work cannot be carried out through voluntary work alone. Efforts need to be made to ensure that something can be done to provide some form of compensation to those who carry out the documentation work.

And, not least, there must be someone overseeing the work, just like when the Municipality of Qeqertalik had a person employed to do this. This position unfortunately no longer exists since a new head of department was employed.

Rasmus Nygård (Greenland Institute of Natural Resources, Dept. Fish & Shellfish)
The data already used for scientific advice comes from models made by scientists based on samples of catch per unit effort (CPUE) from different sources. For example 6,000 individual events of CPUE were reported in just one year, 2021. For each fishing event both catch, area, effort (number of gear and time) and much more is registered and transferred to a government database (LULI).

The Northwest Atlantic Fisheries Organization (NAFO) wants data and not fisher's perceptions. They don't know whose perceptions to listen to. Scientists don't listen to what fishers are saying because scientific advice has to be based on data and not on what people think.
Suggestions for ways to implement user knowledge are welcome. It could be information from stakeholders in reports, such as a report from local organizations like IAPP, SQAPK or Neqitaq or other local unions, that could be included in assessment documents. It could be standardization of opinion. Just as CCI (Consumer Confidence Index) statistics from standard questionnaires can be turned into indices of opinion. It could be scientist-fishers cooperation projects where scientist and fishers work together to improve mutual understanding.

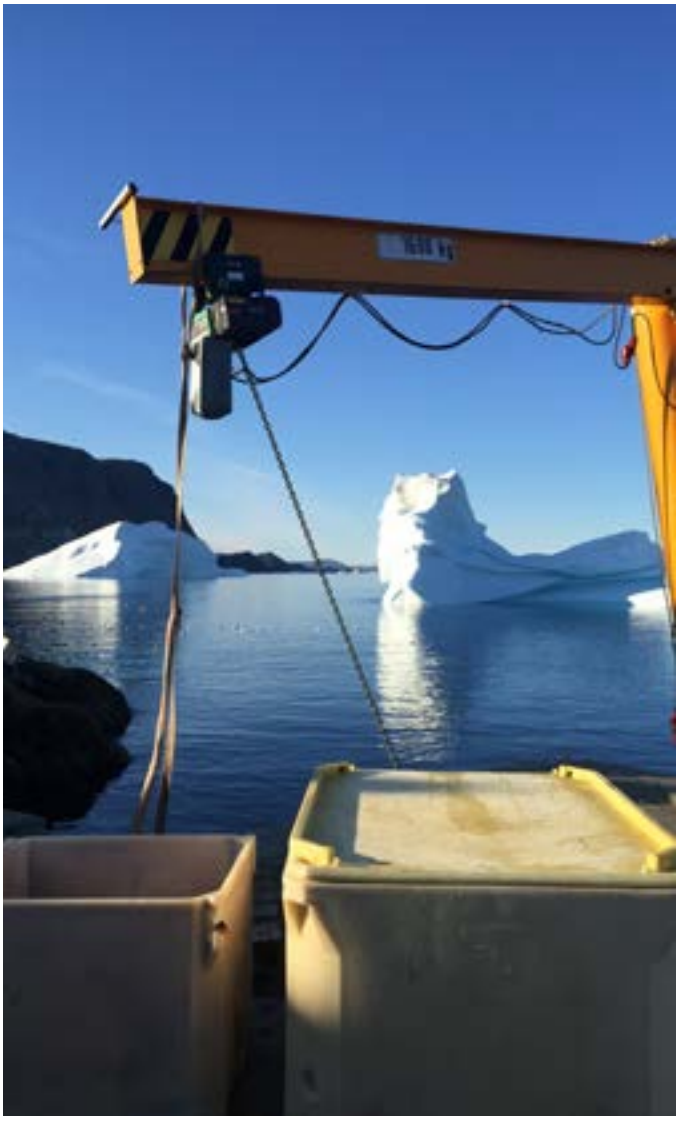
Things have changed over the last 15 years and communities are no longer questioning science. Communities now ask about uncertainty, and what research cannot tell you, so a big change has been happening.

"...communities are no longer questioning science... a big change has been happening"

The Department of Fish and Shellfish at the Greenland Institute of Natural Resources looks at the use of local knowledge to inform decision-makers about the environment and the living resources in Greenland. This is not only required by law but is also a good idea. The question is rather how. There are several ways, and some are already being implemented. One challenge is that local knowledge is not homogeneous. Communication should be easy, direct, and mutually beneficial.

Braulio Dias: Are scientists doing a good enough job in their communities on reporting back?
Rasmus Nygård: We have >60 settlements and it is therefore a big task. There is room for improvement for sure.
Gerth Nielsen: Lost nets is a huge problem.
Rasmus Nygård: The only source of lost fishing gear is fishers. The problem cannot be solved by scientists alone.

Michael Køie Poulsen: Can you help us on how GINR can increase the use of social science?
Rasmus Nygård: I have no idea. I need to think more.
Nuunoq Per Ole Frederiksen: Have you researched Halibut being preyed by other species in relation to the value of halibut?
Rasmus Nygård: Larger vessels, long lines, and gill nets - these are three different indices. For each area e.g., for Disko Bay. User knowledge is useful but the resource users find the same results as scientists.



Parnuna Egede Dahl (Oceans North Kalaallit Nunaat)
Local knowledge covers different interchangeable and confusing knowledge concepts: user knowledge, traditional knowledge, and Indigenous knowledge. Indigenous knowledge is a holistic knowledge concept that includes social and environmental aspects. It has to do with Indigenous culture and ways of life and implies protection of the collective rights of Indigenous Peoples. Local knowledge has an emphasis on residents in a geographical location and has to do with users of natural resources, living and non-living. It has a local culture, content, and context and has no requirement for identity or ethnicity. User knowledge is based on users of living resources (fishers, hunters) and focuses on observations of population development. The context is the management of commercial species, and it is limited to knowledge that is useful for decision-makers.

Sustainability is the goal when aiming for co-creation of knowledge between users, researchers, and managers. Better knowledge provides a better basis for decision-making

and leads to more sustainable management. Challenges include top-down decision and communication. Managers are far away, and dialogue and feedback are deficient. Users have the feeling they are not being heard, partly because of language barriers but also because of an unequal access to information.

"Challenges include top-down decision and communication…"

Meaningful engagement is based on open dialogue and influence over decisions with feedback of knowledge and the decision-making basis. Knowledge, values, and concerns as resources. Participation must be in the whole management process and there must be opportunities for bottom-up measures.

The legislation is in place or under preparation for long-term programmes. Good systems already exist, and data is already being collected. There is a need for meaningful citizen engagement and local anchoring. Interaction, recognition, and feedback is important here. If several communities are no longer reporting in PISUNA, it may be because it is not seen as meaningful as they feel they are not able to influence decisions.

Steen Christensen: Excellent presentation. In fact what we are talking about today is "co-management".
Parnuna E. Dahl: Public meetings are a really bad way of engaging people; this is very clear from my PhD. We should draw on social science methods.

"…public meetings are a really bad way of engaging people; this is very clear"

Nikkulaat Jeremiassen: Excellent presentation. Super work. You said you lost something: we have lost knowledge with regard to hunting tools used.
Braulio Dias: To what extent is the concept of Free, Prior and Informed Consent (FPIC) applied in Greenland?
Parnuna E. Dahl: FPIC is mainly applied in the mineral resource extraction sector. We can still improve a lot, even though it has improved somewhat over the years. Not much talk about Indigenous Peoples and Indigenous Peoples' rights but about closed democracy. Nuuk is sometimes far removed from the rest of Greenland.
Rasmus Nygård: I disagree. We are a small community here in Greenland. We know each other because the population is small even though the country is very big.

Hannah-Marie Garcia (Bering Sea Indigenous Sentinels Network)
Hannah-Marie presented a tool for Community-Based Monitoring (CBM) and Citizen Science used in St. Paul Island, Alaska, by communities with a subsistence lifestyle based on hunting, fishing, and harvesting of island resources. The commercial fishing economy is based on a halibut longline fishing fleet. Co-management and resource monitoring help maintain traditional ways of life. Community members collect local ecological data to support cooperative manage-

ment efforts. The Indigenous Sentinel Network gives remote communities a tool for recording real-time and long-term environmental data and communicating information and data broadly. Traditional Ecological Knowledge and Western science are not seen as "either/or" but rather as different "ways of knowing". Successful conservation efforts must include local communities. Without local buy-in, most conservation efforts are doomed!

Indigenous Sentinel Network components include an online database (Bering Watch), a data collection app with no Wi-Fi or cell signal needed while in the field, communication tools, and training materials (e.g., handbook, survey protocols, etc.). Currently, there are eleven CBM programmes within the network with each programme designed to meet the needs and interests identified by the communities. (www.sentinelsnetwork.org).

"..Without local buy-in, most conservation efforts are doomed"

Co-management of marine mammals is an example of a long-term data collection effort on St. Paul to generate valuable information rooted in local knowledge and context and to help managers and communities understand shifts in migration, health of populations, and more. The network is also expanding into fisheries research as fishing vessel captains requested a

Parnuna Egede Dahl

Jessica Lefevre

Birger Poppel, Palle Smedegaard Nielsen and Robin Holmvang

programme to share knowledge and information with managers via at-sea observations (www.skipperscience.org).

A key benefit of the network is that federal regulation changes are enabling local decisions on key resource management. Other benefits include climate adaptation planning, capacity building in communities, a strengthening of data sovereignty and ownership, and real-time data collection to supplement other environmental surveys and fill data gaps. Goals for the Indigenous Sentinel Network include securing funding for long-term and widely available use at minimum or no-cost to Indigenous users and to secure stable funding that includes adequate and equitable compensation for observers/sentinels/guardians.

The observations are sustained by funding from federal and private grants. The diversity of the communities means that no one solution fits all and the communities still learn from each other. Stakeholder engagement and participation is ensured by giving stakeholders a voice and influence in decision-making. Time is needed to build trust between scientists and communities. We are moving towards co-production with joint formulation of research aims. Financial compen-

sation is needed if the activity is not a part of day-to-day life. It is important to build on existing organizations. Support is provided to those who provide observations. Ownership of data remains with the local community

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Rasmus Hedeholm (Sustainable Fisheries Greenland)
Fisheries in Greenland are managed by the Department of Fisheries and Hunting. Advice on quota-setting is given by the Greenland Institute of Natural Resources, and fisheries are controlled by GFLK (Greenland Fishery License Control).

Sustainable Fisheries Greenland (SFG) is an NGO established by the fisheries sector to give advice on sustainable fisheries in relation to obtaining Marine Stewardship Council (MSC) certificates for Greenlandic fisheries. MSC certification is a necessity in a competitive market in order to maintain high prices. MSC certificates can be conditional. The lump fish roe fishery was given five years to improve problems with by-catches of eider in order to maintain certificate. There is no scientific monitoring of by-catch so we rely on local people for data. Fishers recommend where to set up nets to avoid seaweed and report by-catches. Organizational support and compensation are needed, as well as time to build trust. SFG needs to be present to maintain the interest through dialogue. Cooperation is beneficial for obtaining more information.

Donna Hauser and Roberta Glenn (Alaska Arctic Observatory and Knowledge Hub)
The Alaska Arctic Observatory and Knowledge Hub (AAOKH) programme evolved from SIZONet and is a collaboration around a team of Iñupiat (Alaska Natives) knowledge holders and scientists and students from the University of Alaska Fairbanks. Nearly daily observations are carried out of ocean conditions, sea ice conditions, weather, and wind, as well as fish and wildlife. There are now more than 9,000 observations stored in the ELOKA project database. The web-based platform for data storage is the same as that used for PISUNA-net.

SIZONet was funded through Government of Alaska and federal academic grants. AAOKH is funded through penalties from polluters (Community Service Payments made by corporate defendants who were convicted of federal environmental and maritime crimes in 2014) and is preparing proposals for new federal grants. Such programs are best suited to institutionalized federal funding as it is for co-management of wildlife and natural resources as well as for adaptation to climate change. Visit the website Arctic-aok.org for more information.

Pedro Constantino and Kirsten Silvius (US Forest Service International Programs)
A presentation on community-based Pirarucu (Arapaima gigas) fisheries in Amazonas State, Brazil. Pirarucu fishing needs to be done collectively. Uncontrolled commercial fishing led to population decline during the 90s and government-imposed fishing regulations as a response to international pressure. A management system was designed whereby Community-Based Monitoring is used for determining quotas. The government then grants quotas to the local communities for subsistence and commercial use. Communities will zone their territories with lakes divided into three categories rotated at intervals – no use, subsistence use, commercial use. The community-based monitoring and management has been very successful. Fish stocks have recovered.

Braulio Dias: The law in Brazil can ban commercial wildlife trade and put restrictions on fisheries for non-locals. There are areas designated for the exclusive use of local communities and with a local quota set every year for e.g. fish, molluscs, crab, and shrimp. Local communities can restore fish populations in five years. Sometimes they will face problems with intruders from other areas where fisheries are not being well-managed.

Hery Andrianandrasana: Is the quota-setting science-based?
Braulio Dias: Local communities decide but they may sometimes take scientific advice.

Rikke G. Hansen (Greenland Institute of Natural Resources, Dept. of Mammals and Birds)
GINR is monitoring marine mammals for scientific advice on sustainable hunt. A case example is monitoring a narwhal stock. The work includes planning, research questions, interview surveys, catch reports from hunters, biological parameters of narwhal, DNA analysis, stock identity, satellite telemetry, movements / stock identity, calibration of aerial surveys, aerial surveys, and assessment of abundance, distribution, and trends.

GINR finds depleted populations where the consumption of the resource is faster than it can be replenished. Standard methodologies are applied in the field and data collected at regular intervals. The animal counts are based on accepted statistical procedures and include Bayesian statistics. Advice is based on population growth rates for sustainable harvest. Data and advice is reviewed by international organizations. Advice on the number of animals that can be taken out of a given population is provided based on management areas where individuals from this population can be hunted (hunting regions). Rikke said that the GINR's biological advice is independent of special or economic interests. Local ad hoc data cannot be used in advisory work.

Nuunoq Per Ole Frederiksen: Collaboration is difficult as GINR never visit Attu and local people are not invited to participate in surveys. We have large stocks around Attu, so why do GINR not cooperate with locals?
Rikke G. Hansen: Surveys are based in communities with a landing strip for planes used in aerial population counts. GINR have tried with Facebook groups. It makes sense to cooperate. GINR value the information and are trying to be better at communicating.
Gerth Nielsen: GINR has a limited presence and it is therefore difficult to cooperate.
Rikke G. Hansen: GINR have run information campaigns but they are expensive, often involve few participants and often clash with fishing, hunting and holiday seasons.
Hans Inûsugtoq: Some fishers and hunters are reluctant to speak up and share knowledge with scientists and staff from municipal and central administrations. It is important to involve them anyway. We need to find mechanisms for how this dialogue can happen – time and person-to-person cooperation is important.

Braulio Dias (University of Brasilia, Executive Secretary of the Convention on Biological Diversity from 2012 to 2016)
Braulio talked about Community-Based Monitoring in international processes of the Convention on Biological Diversity (CBD) and future perspectives. The Manaus Letter on Community-based Monitoring for Managing Biodiversity and Natural Resources is a set of recommendations written by 220 participants representing Indigenous communities, academia, organized civil society, practitioners from GOs and NGOs, and government decision-makers from 18 countries who gathered in Manaus, Brazil, from 22-26 September 2014. They met to debate, discuss, and share experiences regarding opportunities, challenges, best practices, and lessons learned. All had a common objective:
1) To improve participatory monitoring practices.
2) To speed up their use by Government Organizations, scientists and civil society.

3) To encourage their application in an appropriate manner.

Kittiwakes on iceberg.

Why do we need best practices for participatory, community-based monitoring and citizen science of biodiversity and natural resource use? Braulio explained:

1. Many protected areas worldwide are inhabited or traditionally used by local and Indigenous Peoples and often have objectives related to securing the livelihoods of these stakeholders;
2. Food security and food sovereignty are of paramount importance to ensure the well-being of rural, traditional and Indigenous Peoples;
3. Local and Indigenous Peoples have the right to manage the resources on which their livelihoods and cultures depend, for current and future generations;
4. The impacts of increasing population pressures and climate change make it more urgent to monitor and manage resource use in these areas;
5. Participatory monitoring has proven to be capable of providing accurate information at local and regional scales using both scientific, local and traditional knowledge methods;
6. Such information has been used as the basis for successful management decisions, implemented either by local people, their organizations or the NGOs and/or government agencies with which they work;
7. It is known that participation by local people in monitoring can lead to effective decision-making regarding sustainable resource management, in comparison with data collected solely in an academic context;
8. In order to ensure resource use rights, continued accumulation of knowledge, and transparency in conservation and development decisions, biodiversity and resource use monitoring must be a participatory process involving all segments of society.

Braulio presented an example of a system of good governance of fisheries by local communities in the Amazon. Here, community-based management is leading to a rapid recovery of the Juruá lakes fisheries. See also the presentation by Pedro Constantino and Kirsten Silvius.

The way forward for the Manaus Letter could be to propose the adoption of CBD Guidelines based on the recommendations of the Manaus Letter and the Aasiaat Workshop. This could be done through a submission to the 12th Meeting of the Open-ended Working Group on Article

8j (Traditional Knowledge, Innovations and Practices). We could also propose inserting a reference to the Aasiaat Workshop and its main findings in a relevant decision to be adopted by the CBD at COP15 - this could be done by a submission of the Danish/Greenlandic government.

"...propose the adoption of Convention on Biological Diversity guidelines based on the recommendations of the Manaus Letter and the Aasiaat Workshop"

The Open-ended Working Group on Article 8j (Traditional Knowledge, Innovations and Practices) was established in 1998 by a decision taken at COP4 of CBD. It meets every two years and is co-presided over by a representative of a national government and a representative of the International Indigenous Forum on Biodiversity. Over the years, many important issues have been discussed and recommended for Indigenous Peoples and Local Communities (IPLC) resulting in several COP decisions, including:
• Akwé:Kon Guidelines for the conduct of cultural, environmental and social impact assessments regarding developments on lands and waters traditionally occupied or used by IPLC
• Tkarihwalé:ri Code of Ethical Conduct to Ensure Respect for the Cultural and Intellectual Heritage of IPLC
• Rutzolijirisaxik Voluntary Guidelines for the Repatriation of Traditional Knowledge of IPLC
• Mo'otz Kuxtal Voluntary Guidelines for the development of mechanisms, legislation or other appropriate initiatives to ensure "prior and informed consent".

The website https://www.cbd.int/traditional/ can be visited for additional information.

Based on lessons learned elsewhere such as Alaska, Canada, Norway and also outside the Arctic – and Greenland, Braulio suggested that a two-tier decision-making should be considered:
1. For common species – local decisions with help from scientists' information.
2. Threatened species. National, regional, and global input. Need consultation and slower decisions.

Regarding the new legislation next year, Braulio understood the Aasiaat Workshop can provide advice on what can be incorporated into the new law, including funding. More certain funding is needed for local communities and to link local and scientific knowledge. Braulio proposed that big fishing and big mining should pay for this.
Next month there is the CBD COP15 in Montreal. This is an opportunity at which Greenland and Danish delegates could present specific proposals for the New Global Biodiversity Framework for 2030 and 2050.
Jessica Lefevre: It is good to have a long-term programme but also a short-term one. I think that different organizations will write up a proposal for a pilot. We must recognize conflicts of interest that makes dialogue difficult. There is need to establish collaboration between natural science and social science.
Nuunoq Per Ole Frederiksen: Very interesting what you are saying. Now we agree that we are doing it the right way. In Qaanaaq the funding stopped following project end. How do you think the future will be for PISUNA in Attu seen from the view of the department.
Søren S. Nielsen: I suggest a committee of individuals to take on the tasks. There is a need to

agree on the terms of reference and focus of this committee, and this should be part of the minutes.
Parnuna E. Dahl: Better collaboration between natural and social sciences is needed. We need to extend the toolkit to GINR and University of Greenland and train scientists in how to engage with communities.
Amalie Jessen: PISUNA has been important. The East Greenland and Qaanaaq experiences are also valuable experiences. The work should continue. Maybe adjust but continue the systems. I agree with Søren, Attu and Qaanaaq have taught us that it is possible. Getting funding from the Cabinet is, however, very difficult. Mineral or Fisheries funding perhaps. Marine mammals, seabirds and terrestrial animals are easier. Fisheries may also be possible but more difficult.

"..getting funding from the Cabinet is very difficult"

Nuunoq Per Ole Frederiksen: I was glad that the Ministry thinks Attu is doing it the right way! What does APN think the future will be for PISUNA Attu?
Amalie Jessen: The experiences of the ongoing projects will continue.

Martin Enghoff (NORDECO)
A wrap up of yesterday's presentations and discussions for the Minister: There is an increased need for fast discussions as climate change is resulting in faster environmental changes. By including local knowledge, it will be possible to take faster decisions on quota-making and all types of regulations. There is a need for more structured and formalized ways, protocols and legal framework with law, executive orders, and regulations in a system. We are working towards 'good practice' in the use of local and scientific knowledge for informing natural resource management. We can see lots of ways of integrating local knowledge depending on whether we are doing long-termed monitoring programs or research projects. It is also very different depending on whether locals just contribute - or if they operate as "agents" doing actual interpretation based on their own ways of thinking. The existing processes, with consultations, hearing processes, etc., are not able to reach out and use the local knowledge. So how can we adjust some of these processes so that they incorporate local knowledge?

All agree that local knowledge is important but, in reality, no-one knows how to do it. The actual integration of local and scientific knowledge is seldom seen. And we hear that it is not easy. It will take a lot of work to get local knowledge and user knowledge used together with Western science, even in the awareness that it will give a better outcome. Having a monitoring programme where hunters and users are doing the actual interpretation of their own data based on their own way of thinking is different from having local hunters and users contributing input to a research project for scientists to analyze data and present the results. What we want to achieve is better management of the living resources that is beneficial to local people. We want to optimize the sustainable use of these resources, not for conservation but for sustainable resource management.

"…All agree that local knowledge is important but, in reality, no-one knows how to do it. The actual integration of local and scientific knowledge is seldom seen"

PISUNA is not spreading like wildfire. It needs further thought. For example, what if you sit as a civil servant in a ministerial department? When the information from scientists is different from that from local communities? How do you take decisions in practice? This question is not answered but we can only learn how to do it by trying. So somehow a pilot testing activity is needed to try this in practice. To try to integrate and take decisions based on this integration. To move from talking to doing. We talk a great deal about where scientific and local knowledge differ but there is often a fair overlap. But there are also differences, and you need formalized processes to navigate these differences.

"..When the information from scientists is different from that from local communities, how do you take decisions in practice?"

A crucial aspect is the continued funding that is necessary for long-term programs. It is difficult, of course, but programs that rely on unsustainable funding sources will not work.

Karl Tobiassen: I assume you will send me a summary that I can use for my future work.
Søren S. Nielsen: We have been talking about this for 20 years. Let's take the first step. We can start with one area.
Braulio Dias: Fisheries and mining could provide funds for Indigenous and local knowledge. Or

a separate fund could be established specifically to support Indigenous and local knowledge. Indigenous and local knowledge is very relevant. We need to better utilize this info in specific decisions on monitoring. Indigenous and local knowledge could be formally incorporated into the decision-making process but the government would have to provide the funds for this to happen.

"...fisheries and mining could provide funds for Indigenous and local knowledge. Or a separate fund could be established specifically to support Indigenous and local knowledge"

Jessica Lefevre (1985-2021 legal counsellor, Alaska Eskimo Whaling Commission)
An international Gold Standard is the bowhead whale management using "Best Available Knowledge" with continued observations and following adaptations in response to observed changes, which makes it possible to preserve culture while meeting national and international goals.

Scientists did research to understand if and how bowhead whale react to industrial sound. Little reaction was observed. Local whale hunters did not recognize these results and advised the scientists to test at specific times in specific areas. When the scientists followed the advice of the local whale hunters, they found that industrial sound had much more effect. A lesson learned is that science should start with what the hunters have seen. Best available science sometimes gives the wrong answer as with sound and whales.

Bowhead whale management is now based on Western science research that built on local observation methods. When Western science and management strategies were implemented to better manage bowhead whale without seeking any sort of local consultation, it resulted in a complete mismanagement due to a flawed technique used by scientists to monitor population sizes. The bowhead whale makes up a large part of the Indigenous diet. In the end, the local communities were able to co-manage the bowhead harvest after convincing environmental scientists to utilize their knowledge. The successful management of the bowhead was a product of the cooperation of both scientists and local communities consisting of 11 settlements in one organization.

Palle S. Nielsen: What if we cannot do it perfectly? Can we compromise?
Jessica Lefevre: Create the structure, feed in, try out, come back.
Birger Poppel: In Greenland we have an additional problem. The scientific experts do not speak Greenlandic. We need interpreters.
Amalie Jessen: How about the legal basis, law, executive orders, and funding?
Jessica Lefevre: An executive order is not that helpful. Laws gives authority. Federal money and oil and gas money are good options. To Birger: Try to conceptualize what they are saying.
Nuunoq Per Ole Frederiksen: We believe PISUNA Attu have some knowledge equal to scientific knowledge. We are pleased to hear that other countries are recognizing that.
Jessica Lefevre: One difference between Alaska and Greenland is that in Alaska there is no sale. All is given away following family tradition.

Finn Danielsen: We now move to the Manaus Letter and the global perspective regarding different ways of knowing. In 2015, the "Manaus Letter: recommendations for the Participatory Monitoring of Biodiversity" was published. This is a guideline comprising 40 recommendations for practitioners who organize, or are developing capacity in, community monitoring of natural resource systems and the environment. The guideline was developed by 220 participants from 18 countries, inc. Greenland and Alaska. It was prepared by invitation of the Convention on Biological Diversity Secretariat at the "International Seminar on Participatory Monitoring of Biodiversity for the Management of Natural Resources" in Manaus, Brazil, 22–26 Sept. 2014. Based on case studies from different regions, we will discuss whether it would be meaningful to update this guideline and promote its broader use across the Arctic and globally.

Herizo Andrianandrasana (University of Warwick) on Madagascar and The Manaus Letter
I would like to share our experience in community-based conservation and monitoring from Madagascar and the relevance of the Manaus Letter. Madagascar is one of the world biodiversity hotspots with an exceptional high rate of endemism mainly due to its long isolation. The natural forests of Madagascar are now very fragmented due to human actions. The biodiversity is important to local livelihoods as it provides people with many services, including wood, medicinal products, food (e.g. tubers, fish), plants for handicrafts, sacred sites, graves, sacred species, emblematic species, local pride, etc.

We need to involve local people in the conservation and monitoring process. We built the capacity of locals to lead ecological monitoring and we invited government officials to go to the field and meet with local people.

The Manaus Letter has been very helpful. Participatory monitoring is increasingly being used, from the tropics to the poles. The Citizen Science Global Partnership has been underway since 2017. Great potential for Indigenous People and Local Community to be engaged in the new biodiversity agreement. The following recommendations from the Manaus Letter have been especially relevant in Madagascar:

1. Design of monitoring initiatives: New initiatives should build on existing local initiatives. Adopt a bottom-up approach. Monitoring targets should be chosen with local communities.
2. Community participation in monitoring initiatives: Local monitors should be selected by the communities themselves. Regular meetings should be organized to disseminate and value the results of the local monitoring.
3. Institutional arrangements and partnerships: Participation of diverse social actors is important, and mutual trust is key.
4. Data quality and management: Data collection should be standardized at a necessary

scale. Local communities should have access to data. Locals should participate in data interpretation.

5. Relationship between monitoring initiatives and public policy: Use monitoring results in decision-making and local management. Respect the information generated by local communities.
6. Recognition of community involvement: Community agents must be formally compensated (financially or otherwise). Their intellectual property must be recognized (e.g. co-authorship of publication).
7. Institutional and community strengthening: Promote the involvement of women, youth and marginalized groups in the monitoring process. Local monitoring should lead to stronger social cohesion.
8. Capacity building: Socio-environmental issues addressed by participatory monitoring should be included as crosscutting themes in local public schools.
9. Systematization, dissemination, and communication: Methodologies should be made broadly available. Results should be disseminated among communities.

Nuunoq Per Ole Frederiksen: In Greenland there are short hearing periods and sometimes we are too late. We are volunteers. Take Brünnich's Guillemot. We see many, and scientists tells us that there are few.
Amalie Jessen: Following up on Nuunoq's comment. There is more hunting of walrus now after recommendation from the hunters.

The sea near Uummannaq.

Braulio Dias: A meeting of the open-ended working group on traditional knowledge will take place in November 2023. Guidelines can be adopted by the COP (Conference of the Parties).
Amalie Jessen: Greenland must negotiate with both Denmark and the EU before addressing the COP. You can make a suggestion to the Cabinet. I am not familiar with CBD. I don't know. If it is too complicated, maybe it will be easier for Norway to do.
Braulio Dias: All we need is one government. Write a short summary of the outcome of this meeting – send it to Montreal and make it available. CBD is obliged to listen to such documents and it is called an "Information Document". We could send the Manaus Letter plus a proposal from this workshop to the CBD Secretariat in Montreal.

Caroline Bouchard (Greenland Climate Research Centre)
Reflecting on the Manaus Letter, I am involved in three ongoing Greenland Climate Research Centre projects with community monitoring components. These are:
Eqalugaq - Status and trends in polar cod populations in Greenland
Eqalugaq - Co-producing knowledge on polar cod in Greenland
Bosanova - Boreogadus saida and newcomers, a community-based monitoring of Arctic cod in Nunavut and Greenland.

Eqalugaq will use an inter-disciplinary approach combining users' knowledge, natural sciences, and community-based monitoring. The project aims to document the status and trends of polar cod populations around Greenland, the importance of polar cod for seabirds and marine mammals, and to anticipate future changes in the polar cod ecosystem.

Bosanova will develop a community-based monitoring programme to track coastal schools of Arctic cod, and document their migration patterns, age-composition, diet, and traditional uses. In addition, we will encourage our community partners to share any observations of ''new'' fish species they encounter in order to track the northward expansion of boreal fish species. We will implement our community-based monitoring programme based on Inuit Qaujimajatugangit (Inuit traditional knowledge) and using the mobile application SIKU: the Indigenous Knowledge Social Network.

SIKU is an example of good practice in using digital platforms. SIKU follow the guiding principles: Respect, Self-Determination, Intellectual Property, Integrity.

Relevant Manaus Letter recommendations include #4 - The methods and instruments used for monitoring should be easy to use, suitable, and appropriate to local practices and culture; and #5 - The designers of a participatory monitoring initiative must (...) keep in mind that the benefits may not compensate for the associated workload (…) and therefore implementation may not be desirable.

Digital platforms are increasingly being used. It's important they benefit community members.

It is therefore suggested that a recommendation about this is added to the Manaus Letter recommendations.

"...Digital platforms are increasingly being used. It's important they benefit community members. It is therefore suggested that a recommendation about this is added to the Manaus Letter recommendations."

Yuka Oishi (Kobe University, Japan) on Siberia
I will talk about two points of Manaus Letter from the point of view of fieldwork in Western Siberian Forest areas, which are populated with Khanty, Mansi and forest Nenets living on a subsistence complex of reindeer herding, hunting-gathering, and fishing.

Husband and wife fishing and hunting between Aasiaat and Akunnaaq.

I will highlight two recommendations of the Manaus Letter that could be especially useful at the site of my fieldwork: #1 - Initiatives should be constructed from the bottom up, incorporating local as well as academic visions and knowledge; and #38 - Methodologies and materials for participatory monitoring, including species identification guides, information management systems and best practices in monitoring and management should be made broadly available.

Freshwater fish are important to Indigenous Peoples in Western Siberia. Khanty live along river and depend on freshwater fish. The populations of white fish have been decreasing over the last decades. The fish spawning ground is within the subsistence and residence territory of Khanty. Strict regulations on fishing have been imposed since 2016. The regulation goals are preservation, recovery, and reproduction of underwater biological resources and maintenance of ecological balance. Fishing with nets, fishing gear, and traps is prohibited from August to November when Khanty fish for winter storage food.

The local people complained over the new fishing regulations with the long period closed to fishing. It was, however, decided to enforce the regulations already issued by the top-down system. There are gaps in perception between the local inhabitants and the administration regarding this decline. The administration recognizes that the river is a common resource and that the fish spawning ground should be protected. They therefore want to limit overfishing by Indigenous Peoples. However, the Khanty who live on the fish spawning river believe that their fishing activity is not overfishing but reasonable.

The original framework no longer fits and recommendation #1 of the Manaus Letter could perhaps overcome the gaps in perception between actors as regards monitoring. As research progresses and local people's memories and awareness increase and new scientific findings are gained, the monitoring design should be changed flexibly. I would add to recommendation #1 that it should be flexible.

Regarding recommendation #38 of the Manaus Letter on methodologies and materials for participatory monitoring, monitoring by local inhabitants and tourists using a mobile phone app that works like a computer game is one option for consideration.

Nuunoq Per Ole Frederiksen: We have difficulties with regulations governing trout fishing where tourists take precedence over local people's fishing rights. Do you have the same problem?
Yuka Oishi: Yes, we do.
Martin Enghoff: Yes, it is a huge problem all over Siberia where tourists are given priority and local people are losing.

Hannah-Marie Garcia (Indigenous Sentinels Network) on the Manaus Letter
Hannah-Marie Garcia from Bering Sea Indigenous Sentinels Network commented on the Manaus Letter: The first few recommendations (# 1-3) regarding Design of Monitoring Initiatives speak to co-production methodologies which we support as a strong methodology and framework to build on. #5 on community initiatives will need external capacity and support to be able to overcome challenges related to "associated workload and governance issues". This should not preclude implementation but may take additional time. #6 is particularly good –

build on existing local initiatives – but should also include a responsibility to learn about and understand existing ones.

With regard to Community Participation in Monitoring/Recognition of Community Involvement outside actors should be integrated into community monitoring not the other way round. External researchers and practitioners should be finding ways to support and build capacity in order to involve as much community participation and leadership as possible. There are so many fundamental needs that must first be addressed before monitoring can be effectively implemented in a community and these need to be incorporated into this model. This highlights the need for advocacy and support (funding) directed to communities in order to address these issues so that they can engage fully in the monitoring. CBM should be community- and/or Indigenous-led, not just "participating in". In #10 it is unclear where the responsibility and burden lies with the implementation of "regular community meetings to disseminate, review and value the information produced."

In regard to recognition of community involvement #27 provides the standard of compensating community participants but there are many aspects that are not direct monitoring that should be considered a part of the process and compensated.

#33 speaks to the capacity building aspect. Why just in formal education programmes? Place based or on the land/ in the community informal and formal information sharing, training, etc. needs to be considered as well.

Data quality and management
#40 concerns systematization, dissemination and communication. The idea that Local, Traditional and Indigenous Knowledge could be systematized is an issue and points out the fundamental problem with Western science setting the standard that, unless data are systematized they are 'anecdotal'.

Hannah-Marie Garcia ask why do all data need to be standardized and publicly available? And how does one "ensure consent among knowledge holders?"

Roberta Glenn and Donna Hauser (University of Alaska Fairbanks)
Roberta shared thoughts about the Manaus Letter and the AAOKH. AAOKH is local community observers and academics working together to understand and document the changing Arctic from their perspectives of Indigenous knowledge holders and Western scientists. AAOKH has the goal of sustained Arctic observing, support to the next generation of Indigenous students and scholars, and the development of locally-relevant data products to inform resource management and community planning aligned with community priorities.

Most of the Manaus Letter recommendations are resonating well with the AAOKH and they are well thought out and nicely worded. The most important is that we are listening to Indigenous Peoples and the communities we are working with and that we are responding to their concerns.

Sledge dogs and boats in Aasiaat.

Roberta highlighted Manaus Letter #26 and #40 regarding Recognition of community involvement and Systematization, dissemination and communication. There should be strings attached so agreements are in place to avoid misuse of information.

Discussions

Jessica Lefevre: Consider a new title for the Manaus Letter.

Nuunoq Per Ole Frederiksen: We in Attu went North to help start PISUNA in Qaanaaq. Here we were told that many scientists visit every year to work and ask questions. Often, they leave without feeding back on what they did. We feel that scientists are paid highly while locals have to work as volunteers. We don't feel that we are treated equally. Scientific/local knowledge integration costs money – also local knowledge.

Caroline Bouchard: Important digital tools are meaningful locally and beneficial to communities, an example is SIKU.

Martin Enghoff: Finn will show some slides he has prepared for this workshop and he will also talk about progress made last night in the preparations for COP15.

Finn Danielsen: All ask for inclusion of Indigenous and local knowledge. The hunting law in Greenland, AMAP of Arctic Council and many other organizations all ask for inclusion of Indigenous and local knowledge but have no systematic approach. Perhaps one could establish 4-5 key steps for how to undertake this process? It could serve as a starting point towards getting more concrete.

Martin Enghoff: We see a need to establish some kind of protocol that can direct the interpretation, systematically collected. We will present this to get things started.

Amalie Jessen: It is much like we do already. Like in East Greenland with narwhal, and NAMMCO. You can see NAMMCO's presentation from the last workshop and what we have done since 2017. Narwhal and polar bear management includes hunters' knowledge.

Birger Poppel: Good point for starting to develop principles. Parts of a more prolific approach. Indigenous and local knowledge is often seen as part of a holistic approach with more general perceptions. Not systematically collected but important. The bowhead whale case would not have been covered by a definition of "systematically collected" in the beginning in Alaska.

Martin Enghoff: What does "systematic" mean? It's not just a story from one fisher or a newspaper clip. But oral tradition built up over time is "systematic". We should not be stopped by one knowledge system being holistic. Much should be done to capture this holistic type of knowledge. It is the real world and impacts people's livelihoods and income. We need to get as much of this knowledge into decision-making as we can.

Jessica Lefevre: It is a useful first effort. It is about two thought systems put together using only one thought-system. Words must be used carefully. Go back to the communities in the real world and ask if it makes sense to them.

Amalie Jessen: I have listened to scientists for many years and to hunters. Systematic collection of knowledge can be defined for each group. Scientists collect data with the same methods and compare over time. Hunters' knowledge comes when you put a map on the wall. Migration will be explained for three subspecies of narwhal – where they prefer to be, when the stock depart, behavior, food, reproduction. Hunters should decide which species we focus on.

Gerth Nielsen: We want to record and fill out forms, have monitoring obligations and contribute. We want to participate. Species composition is changing rapidly in Disko Bay.

Nuunoq Per Ole Frederiksen: We live 200 km from Gerth and we have similar findings in the nature as he describes. Scientists should follow our advice on where to record animals. Things are changing rapidly. So scientists must work in other places. Self-rule regulations are not updated accordingly. Let us update the scientific work so we can benefit from the natural resources as they are now. We want all communities to report.
Nikkulaat Jeremiassen: KNAPK has 72 branches. We want to collaborate on these urgent matters and collect data in a way that gives the best data for management. Polar bear and whales are now in new places. They may be dangerous but we are not allowed to kill them. We want to give data. We want to contribute.
Parnuna E. Dahl: You should not put a date to start hunting but observe the date of arrival. Dates should be more adaptable. Hunting seasons could be made adaptive as in parts of Canada. When birds arrive, locals report it, it is confirmed by drones, then hunting season is set.
Roel May: Populations are debatable. Why not use scientific methods for collecting local observations?
Jessica Lefevre: Who informs decision-making on living resources in Greenland today?
Amalie Jessen: Most polar bear and marine mammal specialists are from outside Greenland. Seabird specialists are also mostly from outside Greenland. Danish biologists and others from outside Greenland. There are huge language problems. Danes and other foreigners need interpreters when talking to KNAPK and 99% of documents are in English. Sometimes documents are too technical. No Greenlandic translators can translate them.
PâviâraK Jakobsen: We want sustainable use. Scientists from outside come here for a very short time and have a long-term impact on our life. Animals here are migratory and their numbers change. Here people go out every day and can collect data. You need to collect monitoring data from a huge area. People in the settlements follow the species. We monitor them. In villages there is a lot of data out there!
Robin Holmvang: Most fisheries scientists are based in Nuuk. Fishers report catch and effort for the CPUE.
Nuunoq Per Ole Frederiksen: We in Attu wonder how it can be so difficult to interpret the data we have collected. After three months, we have heard from no-one. When scientists come and do surveys of the sea area near us we are not informed about it but it is they who decide on our livelihoods.
Finn Danielsen: Should we have a working group pushing for action to move this forward as suggested by Søren?
Nuunoq Per Ole Frederiksen: Good idea!
Amalie Jessen: The Minister did not make any promise to set up a working group.
Nikkulaat Jeremiassen: Let us prepare a document summarizing the conclusions from this workshop.
Palle S. Nielsen: You can send the document to the CBD Secretariat, it will be helpful for the processes at the CBD.
Søren S. Nielsen: We can't wait another 20 years. We have to get moving now. We must continue the work even though we may not be able to agree on a document today.
Amalie Jessen: We could write a letter from this group, from the participants in this workshop, not the government, to the CBD Secretariat. It seems that Karl will continue to support the idea of local knowledge being developed even though he only promised the law in Parliament next year and the executive order. The proposed letter to the CBD could be used as the document. Except for a few tweaks, it is fine.

"..we could write a letter ... from the participants in this workshop ... to the CBD Secretariat"

Birger Poppel: I think it is good idea to have a working group of 3-5 persons, including KNAPK. The five steps for integrating local knowledge and conventional scientific knowledge presented this morning could be one of the things that the working group further develops. The working group could aim to present something to the Minister and APN.
Hery Andrianandrasana: Need outreach to local government and to the media, displaying the results of using both local knowledge and conventional scientific knowledge. If some people don't believe in the usefulness of Indigenous and Local Knowledge (ILK), a MSc student could be asked to document some of the ILK and demonstrate its usefulness to decision-making. It was mentioned that the national radio had run interviews with Karl, Nikkolaat and Amalie in connection with the workshop.
Steen Christensen: It will be important to work with the local communities and further empower them to become a fuller part of the processes.

It was agreed to establish a working group outside of government to push for action. It was agreed to revise the one-pager with conclusions for the CBD and then submit it to the CBD Secretariat. It was agreed that it would be valuable to get the Manaus Letter updated and adopted as an official CBD guideline. NORDECO, with partners, would revise and update the text in the Manaus Letter based on the many inputs received before and during this workshop. They would then send it out for a last round of comments to all workshop participants and, if possible, to the 200+ participants in the original discussions in Manaus. When completed, the document would be handed over to the Greenland Ministry of Environment representative in the CBD Article 8.j Working Group for approval or endorsement at their 12th meeting, which is scheduled for November 2023.

"...it was agreed to establish a working group to push for action" and "...that it would be valuable to get the Manaus Letter updated and adopted as an official CBD guideline"

Workshop on Bayesian Belief Networks led by Roel May (NINA)
A separate workshop session prepared by Roel May, Birger Poppel and Vivianne Mazzocco was held on Bayesian Belief Networks (BBN) as a tool for management and how to manage a socio-ecological system from a holistic point of view. The session included presentations, group work and final plenum discussions.

Workshop on the Arctic Practices System (APS) with presentation by Stein Sandven (NERSC), Siri Jodha Khalsa (IEEE) and Jay Pearlman (IEEE)

A separate workshop session was also held on the Arctic Practices System (APS). The APS is planned to be a digital database on practices used by people living and working in the Arctic. The APS is envisaged to be a sustained repository for practices related to environmental observations, resource exploitation and other activities in the Arctic. A 'practice' means a documentation in digital form of how things are done, for example, an observation of a specific ocean phenomenon. What an APS should do will be identified in dialogue with people living or working in the Arctic with knowledge about practices in their daily work. The APS will be "populated" by people who want to share their knowledge with others by inserting documents into the system. The APS will hold documents describing how things are done, for example, how environmental data is collected and what methods are used, etc. An example of Arctic practices is found at https://repository.oceanbestpractices.org/handle/11329/1291, where you can give keywords and the repository will identify documents containing those keywords. After the presentation, a questionnaire in three languages was handed round and the participants began filling it out alone or in groups. A total of 20 participants filled out the questionnaire.

2. Workshop programme

Programme

Monday 28 November: Travel to Aasiaat
International participants: Flights from Copenhagen airport at 09.00 by Air Greenland, arrival Aasiaat 12.10 (duration 7 h 10 min).
Check-in at Hotel Sømandshjemmet, Aasiaat, tel. +299 892711, aasiaat@soemandshjem.gl

Tuesday 29 November 0900-16.00: How is the future for the use of local knowledge to inform decision-making on natural resources – Forsamlingshuset Aasiaat
We will together undertake a review of the future for how local knowledge can contribute to inform decision-making on natural resources. Moreover, we will explore how the financial and organizational sustainability of CBM programs can be assured, and how CBM and scientific data can be connected in practice when this is relevant

9:00-9:20 Welcome (proposed)
Mayor Ane Hansen, Qeqertalik Municipality
Naalakkersuisoq Karl Tobiassen (Minister of Fisheries and Hunting)

9:20-9:30 Intro: Finn Danielsen, Martin Enghoff, Michael Køie Poulsen

9:30-11:00 How do you see the future for local knowledge to inform decision-making on natural resources in Greenland: Should local knowledge be further used for informing decision-making? How?

Representatives of the responsible authorities:
1. Naalakkersuisoq Karl Tobiassen (Minister of Fisheries and Hunting, proposed, 15 min.)
2. APN Hunting, Amalie Jessen
3. APN Fisheries, Robin Holmvang
4. Råstofstyrelsen, Rannvá Clementsen / Rasmus Lindholm
5. Miljøstyrelsen for Råstofområdet, Steen Christensen
6. Qeqertalik Municipality, Hans Inûsugtoq (proposed)
(10 minutes each).

11:00-11:15 Coffee break

11:15-12.00 Perspectives from organizations and institutions:
1. KNAPK (Association of Fishers and Hunters), Nikkulaat Jeremiassen / Henning Dalager
2. Piniakkanik Sumiiffinni Nalunaarsuineq (PISUNA) in Attu, Nuunoq (Per Ole) Frederiksen
3. Greenland Institute of Natural Resources, Dept. Fish & Shellfish, Rasmus Nygaard
4. Oceans North Kalaallit Nunaat, Parnuna Egede Dahl (10 minutes each).

12:00-13:00 Lunch

13:00-14:00 How can the financial and organizational sustainability of CBM programs be assured? Lessons from case examples, followed by discussion in plenum

Presentations by resource persons:
1. Bering Sea, Indigenous Sentinels Network, Hannah-Marie Garcia (15 minutes
2. Greenland, Sustainable Fisheries Greenland, Rasmus Hedeholm (5 minutes)
3. Alaska, Arctic Observatory & Knowledge Hub, Donna Hauser & Roberta Glenn (video, 5 minutes)
4. Brazil, Kirsten Silvius & Pedro Constantino (video, 5 minutes)

Plenum: Discussion of priorities / necessary tasks ahead

14:00-14:15 Coffee break

14:15-16:00 How can CBM and scientific data be connected in practice for management decision-making when this is relevant? Lessons from case example, followed by discussion in plenum

Presentation by resource persons:
1. Greenland Institute of Natural Resources, Dept. Mammals & Birds, Rikke G. Hansen (10 minutes)
2. Universidade de Brasília, Braulio de Souza Diaz (10 minutes)
3. Jessica Lefevre (20 minutes)

Plenum: Discussion of priorities / necessary tasks ahead

19:00 Dinner at restaurant (hosted): Restaurant Nanoq, Fr. Lyngesvej 12

Wednesday 30 November 0900-16.00: Towards the development of global 'good practice'guidelines in community-based monitoring and management of natural resources

In 2015, the "Manaus Letter: recommendations for the Participatory Monitoring of Biodivesity" was published (Link: http://dx.doi.org/10.25607/OBP-965). This is a guideline comprising 40 recommendations for practitioners who organize, or develop capacity in, community monitoring of natural resource systems and the environment. The guideline was developed by 220 participants from 18 countries, inc. Greenland and Alaska. It was prepared by invitation of the Convention on Biological Diversity Secretariat at the "International Seminar on Participatory Monitoring of Biodiversity for the Management of Natural Resources" in Manaus, Brazil, Sep. 22–26, 2014. Based on case studies from different regions, we will discuss if it is meaningful to update this guideline and promote its broader use across the Arctic and globally.

9:00-9:10 Intro: Finn Danielsen, Martin Enghoff, Michael Køie Poulsen
9:10-9:25 The Manaus Letter process (Herizo Andrianandrasana, University of Warwick, UK) (15 minutes)
9:25-9:40 CBM in international processes of the Convention on Biological Diversity - and future perspectives (Braulio de Souza Diaz, former Head of Secretariat, CBD & Professor, Universidade de Brasília, Brazil) (15 minutes)

9:40-9:55 Coffee break

9:55-12:00 Are the 40 recommendations in the Manaus Letter still relevant, or are some of them no longer helpful? Are there new recommendations that are also important? Case examples (followed by questions/answers)
1. Greenland, Caroline Bouchard (3 slides, 5 minutes)
2. Arctic Russia, Kobe University, Japan, Yuka Oishi (15 minutes)
3. Bering Sea, Indigenous Sentinels Network, Hannah-Marie Garcia (5 minutes)
4. Brazil, Kirsten Silvius & Pedro Constantino (video, 5 minutes)
5. Alaska Arctic Observatory & Knowledge Hub, Donna Hauser & Roberta Glenn (video, 5 minutes)
6. Alaska, Jessica Lefevre (5 minutes)

12:00-13:00 Lunch

13:00-14:30 Group work. Questions: How can an updated Manaus Letter be completed and more widely disseminated? For example, what can be recommended with regards to sustaining and financially securing CBM programs? Would it be helpful if an international institution would 'host' the guidelines as a 'standard' on CBM?

14:30-15:00 Coffee break

15:00-16:00 Plenum. Presentation of group findings. Discussion of priorities / necessary tasks ahead

Thursday 1 December 9:00-12:00: Excursion.
Boat trip to Disko Bugt. Alternatively, guided walking tour in Aasiaat town, dependent on the weather

12:00-12:30 Lunch

12:30-15:00: Session about a software tool that can guide decision-making in complex social-environmental systems (led by Roel May, Birger Poppel, Vivianne Mazzocco) – Forsamlingshuset Aasiaat Statistical models have considerable potential to guide decision-making in areas characterized by limited scientific data and substantial local knowledge.

12:30-12:45 Introduction to the use of Bayesian (BBN) models in natural resource management and CBM-programmes: Roel May

12:45-13:00 Demo of the surBayes tool: Roel May

13:00-13:30 Plenum discussion: In which natural resource management contexts and CBM situations in the Arctic could BBN models be used for scenario assessments?

13:30:14:30 Group work: Build your own BBN model using the surBayes app.

14:30-15:00 Plenum discussion: Strengths and weaknesses of BBN models. What is their usefulness and how can they guide decision-making? Coffee/tea available

15:00-16:30: Session on Arctic Practice System (led by Siri Jodha Khalsa, Stein Sandven)
An Arctic Practices System (APS) is envisioned to be a sustained repository for practices related to environmental observations, resource exploitation and other activities in the Arctic. A ´practice´ means a documentation in digital form of how things are done for example in observation of a specific ocean phenomenon. What an APS should do will be identified in dialogue with people living or working in the Arctic with knowledge about practices in their daily work. An example of Arctic practices is found at https://repository.oceanbestpractices.org/handle/11329/1291, where you can give keywords and the repository will identify documents containing those keywords.

15:00-15:10 Introduction to the concept of an Arctic Practice System (APS)
15:10-15:30 Demo of Arctic Community in the established Ocean Best Practice System (OPBS), where more than 100 Arctic Practices documents are stored
15:30-16:30 Desirable characteristics for the APS? First cut at priorities.
Discussion led by Siri Jodha and Stein Sandven. Coffee/tea available

16:30-17:00 Wrap-up of the three-day workshop and next steps, by Finn Danielsen, Martin Enghoff, Michael Køie Poulsen

Friday 2 December: Departure
International participants: Flights from Aasiaat airport at 10.30 by Air Greenland, arrival Copenhagen 20.00 (duration 5 h 30 min).

3. List of participants

Pauline L. Abelsen, Qeqertalik Municipality / Communication
Herizo (Hery) Andrianandrasana, Institute Global Sust. Development, Univ. of Warwick
Denis Bidstrup, Qeqertalik Municipality / Byggesagsbehandler
Inuuteq Bidstrup, Qeqertalik Municipality / Fagkoordinator
Caroline Bouchard, Greenland Climate Research Centre
Joachim Christensen, Ministry for Agriculture, Self-Sufficiency, Energy and Environment
Steen Christensen, Environmental Agency for Mineral Resource Activities
Rannvá Clementsen, Mineral License and Safety Authority / Råstofstyrelsen
Pedro Constantino, US Forest Service International Programs
Finn Danielsen, NORDECO
Braulio F. S. Dias, Universidade de Brasília
Parnuna Egede Dahl, Oceans North Kalaallit Nunaat
Martin Enghoff, NORDECO
Per Ole (Nuunoq) Frederiksen, Fisherman and Hunter, Coordinator of PISUNA Attu
Hannah-Marie Garcia, Indigenous Sentinels Network, Alaska
Roberta Glenn, University of Alaska Fairbanks
Ane Hansen, Mayor, Qeqertalik Municipality
Rikke G. Hansen, Greenland Institute of Natural Resources, Dept. Mammals & Birds
Donna Hauser, University of Alaska Fairbanks
Rasmus Hedeholm, Sustainable Fisheries Greenland
Robin Holmvang, Ministry of Fisheries and Hunting / APN-Fisheries
Hans Inûsugtoq, Qeqertalik Municipality
PâviâraK Jakobsen, Qeqertalik Municipality, Coordinator of PISUNA in Qeqertalik
Nikkulaat Jeremiassen, Greenland Association of Fishermen and Hunters / KNAPK
Amalie Jessen, Ministry of Fisheries and Hunting / APN-Hunting
Siri Jodha Khalsa, University of Colorado, Boulder
Jessica Lefevre, Resource person, Alaska
Rasmus J. F. Lindholm, Mineral License and Safety Authority / Råstofstyrelsen
Karl S. Marcussen, Fisherman and Hunter, PISUNA Attu
Roel May, Norwegian Institute for Nature Research (NINA)
Vivianne Mazzocco, PhD student, University of Copenhagen
Søren Stach Nielsen, CAPARDUS
Gerth Nielsen, Part-time Fisherman and Hunter, Akunnaaq
Johan Nielsen, Fisherman and Hunter, PISUNA Attu
Palle Smedegaard Nielsen, Ministry for Agriculture, Self-Sufficiency, Energy and Environment
Rasmus Nygård, Greenland Institute of Natural Resources, Dept. Fish & Shellfish
Yuka Oishi, Rural Sociologist, Kobe University
Gerth P. Olsen, Qeqertalik Business Council
Jørgen Isak Olsen, Ministry of Fisheries and Hunting / APN
Ina Elisabeth Olsen, Interpreter
Birger Poppel, Ilisimatusarfik - University of Greenland
Michael Køie Poulsen, NORDECO
Tida Ravn, Interpreter

Ane J. Siegstad, Head of Secretariat, Qeqertalik Municipality
Kirsten Silvius, US Forest Service International Programs
Nivi Strunz, Municipal Director, Qeqertalik Municipality
Karl Tobiassen, Naalakkersuisoq / Minister for Fisheries and Hunting
Elmer Topp-Jørgensen, Knowledge Co-Production Project & INTERACT, University of Aarhus
Erneeraq Ugpernangitsoq, Fisherman and Hunter, PISUNA Attu

Hery Andrianandrasana sharing experiences from Madagascar at Aasiaat workop.

Søren Stach Nielsen inteviewing Minister of Fisheries and Hunting Karl Tobiassen.

Joachim Christensen, Gerth Nielsen, Nikkulaat Jeremiassen (speaking), Nuunoq Per Ole Frederiksen and Karl S. Marcussen during the workshop.

4. Recommendations to the CBD Secretariat

ENGLISH VERSION BELOW / TULUTTUUA ATAA'TUNGAANIIPPOQ

Sekretariatet for Konventionen om Biologisk Mangfoldighedimi (Uumassusillit Assigiingisitaarneri pillugit Isumaqatigiissutip Allattoqarfiani) pisortamut

Workshopeqartitsineq "Pinngortitami tunngassutilinnut ingerlatsinermi najugaqartut ilisimatuullu ilisimasaasa atorneqartarnerini 'periutsit pitsaasut' pillugit suliniuteqarneq," Aasianni Kalaallit Nunaanni ingerlanneqarpoq 2022-mi novembarip 29-annit decembarip aallaqqaataata tungaanut (Aasianni workshopeqarneq). Workshopeqartitsineq Issittup Ilisimatusarfianit (The University of the Arctic), Uddannelses og Forskningsministeriet (Ilinniartitaanermut Ilisimatusarnermullu Naalakkersuisoqarfik) aamma EU-p Horizon 2020 programianit CAPARDUS pillugu suliniut aqqutigalugu aningaasalersorneqarsimavoq.

Pinngortitami pisuussutsit najugaqartunit nakkutigineqartarnerat (Community-based monitoring of natural resources (CBM)) aamma Innuttaasut suleqatigalugit ilisimatusartarneq (Citizen Science (CS)) sakkussatut pilersinneqarsimapput pinngortitami tunngassutilinnut nakkutiginnittarneq tunngavigalugu sukumiinerusumik aalajangiisarnissaq siunertaralugu, taamatullu naleqqussartumik ingerlatseriaaseq (tilpasningsorienteret forvaltning - adaptive management) aqqutissiorneqarsinnaaqqullugu. Periutsit taakku atorlugit silap allanngoriartornerata kingunerisaanik ilungersunartorsiortitsisarnerit pinasuartumik aalajangiiffigalugit qisuariarfigineqarsinnaapput. Piujuartitsineq, inuussutissaqarneq taakkuninngalu naammattunik sillimmateqarnissaq pillugu qulakkeerinissamik aqqutissiuussisunut ilaapput.

"Manausimit Allagaq: Uumassusillit assigiinngisitaarneri pillugit suleqatigiilluni nakkutiginninnissaq pillugu innersuutit" (The "Manaus Letter: Recommendations for the Participatory Monitoring of Biodiversity" (ML)) aqqutigalugu CBM-ip aamma CB-p iluani aaqqissuussillutik ineriartortitsillutilluunniit ingerlatsisut malittarisassiorneqarput. Taanna pilersinneqarsimavoq 2014-imi CBD-p allaffeqarfiata qaaqqusaattut peqataasut 220-t nunanit assigiinngitsuni 18-ineersut aalajangiinerisigut. ML pilersinneqarmalli nunarsuaq tamakkerlugu ML-ip innersuussutaasa atorluarneqarsimanerinik arlalinnik assersuutissaqarpoq. Aasianni workshopeqartitsineq misilittakkanit taakkunannga aallaaveqarpoq.

Aasianni workshopeqartitsinermit qitiusumik inerniliinerit. Peqataasut:

1. Nunat inoqqaavisa nunanilu pineqartuni najugaqartut ilisimasaasa pingaaruteqassusii naleqassusiilu pingaartitaralugit unnerput, taamatullu nunat inoqqaavisa najugaqartullu (IPLC-t) ilisimasaat pinngortitap pisuussutai pillugit ingerlatsinerup iluani naligiissumik atorluarneqartassasut.
2. Isumaqatigiipput CBM aamma CS pinngortitami avatangiisit pillugit ilisimasanik pissarsiaqarnissamut, taakkulu pinngortitami pisuussutsit pillugit ingerlatsisunut paasissutissiissutissatut atussallugit pingaaruteqartuusut.
3. Uppernarsaapput nunat inoqqaavisa ilisimasaat nunarsuattalu kitaani ilisimatusariaatsit nalinginnaasut, IPLC-llu ilisimasaat, peqatigiisillugit tapertariittut pinngortitami tunngassutilinnut ingerlatsinermi aalajangiinissamut ilisimasat annertusaataassasut.
4. Manausimit Allakkamit innersuutigineqarsimasut nalilersorpaat, paasineqarporlu CBM aamma CS eqqarsaatigalugit siunertarisanik pilersitsinissamut iluatsittumik najoqqutarineqartarsimasut.

5. Pinngortitami tunngassutilinnut ingerlatsinermi ilisimasat pillugit paasissutissanik avitseqatigiittarnermi, isumasioqatigiittarnermi attaveqaqatigiillunilu oqaloqatigiittarnermi periutsit atortulersuutillu pisariaqartumik ataavartumillu pitsanngorsaavigineqarnissaasa pisariaqassusiat erseqqissarpaat.
6. Aalajangiisoqassatillugu nunat inoqqaavisa najugaqartullu ilisimasaat (IPLC-t) nunanilu killerni ilisimatuut ilisimasaat tapertariisittarnissaannut periutsit kinguneqarluartitsisussat suli misilittarlugillu pilersinneqartariaqartut pisariaqartoq paasineqarpoq. Kinguarteqqinneqassanngilaq.
7. Siunnersuutigaat naalakkersuisut assigiinngitsut ukioq 2020-p kingorna nunarsuaq tamakkerlugu uumassusillit assigiinngissitaarnerat pillugu sinaakkutissiat pillugit atuutilersitsinissaat pilersinnagu, nunat inoqqaavisa (ILPC-t) innuttaasullu pinngortitap allanngoriartorneranut tunngassuteqartut qanorlu uumassusillit assigiinngissitaartut aarlerinartorsiortiginerinut tunngasut pillugit ilisimasaat katersorlugit akuuteqqaartassagaat, taamatullu avatangiisit pillugit innuttaasut politikikkullu aalajangiisartut akornanni qaammarsaanissaq sulissutigissagaat.
8. Pinngortitami tunngassutilinnut ingerlatsinermi alisinnerusoq isigalugu naatsorsuutigineqarsinnaasumik aningaasaliisarnissaq taamatullu CBM IPLC-lu eqqarsaatigalugit ilusilersukkamik toqqammaveqartumik inatsisitigut tunngavissat qulakkeerneqarnissaat pisariaqartoq naqissuserpaat.
9. Isumaqatigiipput Manausimit Allakkap innersuussutaasa timitalersorneqarnissaat suli pisariaqartoq.

ENGLISH VERSION

To The Director, the Secretariat of the Convention on Biological Diversity

The workshop "Towards 'good practice' in the use of local and scientific knowledge for informing natural resource management" was held in Aasiaat, Kalaallit Nunaat, 29 November to 1 December 2022 (the Aasiaat Workshop). The workshop was funded by the University of the Arctic, The Danish Agency for Science and Higher Education, and the EU's Horizon 2020 programme through the CAPARDUS project.

Community-based monitoring of natural resources (CBM) and Citizen Science (CS) are tools that can broaden the basis for management decisions and support adaptive management. They can lead to fast decision-making processes that are able to react to changing climate and pressures. They contribute to sustainability, livelihoods, and food security.

The "Manaus Letter: Recommendations for the Participatory Monitoring of Biodiversity" (ML) provides guidelines for practitioners who organize, or develop capacity in CBM and CS. It was developed by 220 participants from 18 countries by invitation of the CBD Secretariat in 2014. Since the ML was developed, there have been several examples of utilization of the ML recommendations around the world. The Aasiaat Workshop draws on these experiences.

Key outcomes of the Aasiaat Workshop. The participants:

1. Stress the importance of recognizing the value of indigenous knowledge, and the equitable use of it, in natural resource management.
2. Agree on the importance of CBM and CS to obtain knowledge on the natural environment to inform management of natural resources.
3. Acknowledge that knowledge of Indigenous Peoples and Local Communities and con-

ventional science together complement and increase the collective knowledge for decision-making in natural resource management.

4. Evaluate the Manaus Letter recommendations and find that they have contributed successfully to establishing programs on CBM and CS.
5. Highlight the necessity of a continuous focus on improving the structures and systems for information-sharing, communication and dialogue related to knowledge on natural resource management.
6. Identify a need for further testing, and establishing, effective processes for integrating knowledge of Indigenous Peoples and Local Communities and conventional science in decision-making. Do not delay the process.
7. Propose that governments implementing the post-2020 global biodiversity framework must involve Indigenous Peoples and Local Communities to include their knowledge on how nature is changing, and the responses that are being taken to address the biodiversity crisis, while also raising environmental awareness among the general public and policy makers.
8. Stress the need for securing reliable long-term funding and an enabling policy and legal basis for structured CBM and involvement of Indigenous Peoples and Local Communities in natural resource management.
9. Agree on the need to continue to put the Manaus Letter recommendations into practice.

5. The Manaus Letter Guidelines for the Participatory Monitoring of Biodiversity

ENGLISH VERSION BELOW

Manaus'imit allagaq: Pisuussutinik uumassusilinnik sumiiffikkaani uppernarsaasarnermut aqutsinermullu inassutigisat

Sumiiffikkaani uppernarsaasarnermik aqutsinermillu misilittakkanik oqaluuserinninniarlutik agguaassiniarlutillu ulluni 22.-26. septembari 2014-imi Brasiliami Manaus'imi nunanit 18-init nunap inoqqaavisa, inuiaqatigiit, ilisimatusartut naalagaaffinnilu aalajangiisartut sinniisaat katersuussimapput. Kalaallit Nunaannit aamma Alaskamit inunnik peqataasoqarpoq. Peqataasut tamarmik pisuussutinik uumassusilinnik sumiiffikkaani uppernarsaasarnerup aqutsinerullu nukittorsarnissaa pillugu ataatsimoorussaminnik kissaateqarput. Sumiiffikkaani uppernarsaasarnermik aqutsinermillu atugaqartarneq oqartussaasoqarfiit, ilisimatusartut aamma inuiaqatigiit akornanni siuarsarniarpaat.

Pisuussutinik uumassusilinnik sumiiffikkaani uppernarsaasarnerup aqutsinerullu iluini 'pitsaasumik periuseqarnissamut' inassutinik arlalinnik Manaus'imit allagaq imaqarpoq. Inassutigisat tassaapput Manaus'imi ataatsimiinnerup inernerisai. Inassutigisat tamatigoortuupput, taakkulu attuumassutaat pilersitanut ataasiakkaanut tamakkununnga siunertamit, aammalu sumiiffinni ataasiakkaani pissusaasunit immikkut ittunit aalajangerneqarput.

Manaus'imit allakkamit inassutigisat

Pisuussutinik uumassusilinnik uppernarsaasarneq pillugu ingerlatassanik ilusilersuinerit

1 Pisuussutinik uumassusilinnik sumiiffikkaani uppernarsaasarneq aqutsinerlu pillugit pilersitat 'ataa'tungaanit' aallartisartariaqarput. Sumiiffikkaani inuit ilisimatusartullu, aammalu taakku takorluugaat ilisimasaallu ilannguttariaqarput.
2 Nunaqarfiit peqatigalugit oqaloqatigiinnikkut inissisimaffiit akisussaaffiillu nassuiartariaqarput. Nunaqarfinni piginnaasat, pisariaqartitat soqutigisallu sianigineqartariaqarput.
3 Sumiiffigisami isumalluutit uumassusillit taakku inuussutigalugit pingaaruteqartut, imaluunniit aningaasaqarnikkut naleqartut, allatulluunniit nunaqarfinni innuttaasunut pingaaruteqartut pingaarnersiortariaqarput.
4 Pisuussutinik uumassusilinnik sumiiffikkaani uppernarsaanermut aqutsinermullu atorneqartut periutsit sakkullu atornissaat pisariussanngillat, aammalu sumiiffikkaani periusaasumut kultureqarnermullu naleqqiullugit naleqqutissapput.
5 Sumiiffikkaani uppernarsaasarnermut aqutsinermullu ingerlatassamik ilusilersuinermi ingerlatassap aallartinnera sioqqullugu ingerlatassap naammassinissaanut attuumassutilittut ilorraap aamma killup tungaanut kingunerisinnaasat isumaliutigineqassapput. Taamaalilluni suliamut pisariaqartitamut naleqqiullugu iluaqutissat anginerunissaat qularnaarneqassaaq.
6 Periarfissaqarfiatigut pilersitat nutaat taarsiiginnaratik sumiiffinni pilersitanik taakkunaneersunik tunngaveqartariaqarput.

7 Ilisimasat katersat ataatsimoorullugit isumaqatigiissutaareersunik isumalluutinut uumassusilinnut taakkununnga aalajangiussinernut, allatulluunniit inuiaqatigiinnut attuumassutilittut avatangiisinut politikkerisanut anguniakkanullu ilalersuisariaqarput.
8 Periutsit, aqutsinerit, paasissutissat suliarisimasat, aammalu paasissutissanik atuinerit akuttoqatigiissaartumik nalilersortariaqarput. Taamaalilluni ajornanngippat pisarialinnik iluarsiisoqarsinnaasoqartassaaq.

Sumiiffikkaani uppernarsaasarnermut aqutsinermullu piniartut aalisartullu, avatangiisimillu soqutigisallit allat peqataanerat

9 Sumiiffikkaani kattuffinnit tapersersorneqarlutik nunaqarfinnit namminersuutigisatut sumiiffikkaani uppernarsaasarnermut aqutsinermullu ilaasutut piniartut, aalisartut avatangiisimillu soqutigisallit allat toqqarneqartariaqarput. Inuit akisussaaffigisaat, piginnaasaat, pimoorussinerat misilittagarisaallu sianiginiarneqartariaqarput.
10 Isumalluutit uumassusillit pillugit aalajangiussinerni piniartut aalisartullu inissisimaffii sumiiffikkaani uppernarsaasarnermi aqutsinermilu sutigut tamatigut siamasissumik peqataatsitsinerup siuarsarneratigut nukittorsarneqarsinnaapput. Ilisimasanik pilersitanik, aqutsinermullu siunnersuutigisat tamakku paasisitsiniutiginiarlugit naliliiffiginiarlugillu akuttoqatigiinnik innuttaasut ataatsimisinneqartariaqarput.

Peqatigiiffigisaqarfiit

11 Sumiiffikkaani uppernarsaasarneq aqutsinerlu iluatsissinnaassappat suliaqartut assigiingitsut peqataanissaat pisariaqarpoq. Pilersitat aallartisarneri sioqqullugit suleqatigiinnerit najoqqutassalertariaqarput.
12 Sumiiffikkaani, nunap immikkoortuini nunarsuarmilu suleqatigiinni ilaasuni taakkunani soqutigisanik kajumissutsinillu sumiiffikkaani uppernarsaasarneq aqutsinerlu pillugit pilersitat kattussisariaqarlutillu oqimaaqatigiissitsisariaqarput. Illua'tungeriit akornanni tatigeqatigiinneq iluatsitsinerup angunissaanut aalajangiisuuvoq. Illua'tungeriit akornanni attuumassuteqarnerit erseqqissuussapput. Illua'tungeriit tamarmik piviusorpalaartunik naatsorsuuteqartariaqarput. Pilersitanut anguniakkat erseqqissumik nassuiarsimasariaqarput, illua'tungerisallu tamarmik soqutigisarisaannik sianiginnissapput.

Paasissutissat pitsaassusaat

13 Pisuussutinik uumassusilinnik taakkuninnga sumiiffikkaani uppernarsaallunilu aqutsinerit pillugit pilersitat anguniakkaminnik tikitaqassagunik paasissutissat pitsaassusaat tunngaviupput.
14 Paasissutissat pitsaassusaat arlalitsigut qulakkeerneqarsinnaapput. Soorlu 1) paasissutissanik katersuinermi ilaasunik inunnik akuttoqatigiissaakkamik sungiusaanikkut, 2) paasissutissat pitsaassusaannik ilisimatusartut innuttaasullu naliliiuartarnerisigut, 3 sumiiffikkaani uppernarsaasarnermi aqutsinermilu sutigut tamatigut innuttaasunik ilaatitsinikkut, aamma 4) inuiaqatigiit tungaannit ataatsimoorussamik paasinninnermik inooqatigiiffimmilu nakkutilliisarfimmik pilersitsisoqarsimaneratigut. Sumiiffikkaani siulersuisut, sumiiffikkaani uppernarsaasarnermik aqutsinermillu sulinermi peqatasut paasissutissat pitsaassusaannik uppernarsaasarnermi akisussaaffeqartuusariaqarput.
15 Periarfissaqarfiatigut databasini kukkussutit katersuutsinnaveersinniarlugit akuerisaasutut naatsorsueqqissaarinermik paasissutissanillu immikkoortiterinermik aaqqiissutit atorneqa-

rtariaqarput. Tamanna paasissutissat pitsaassusaannik kinaassusersiunnginnermik assigiissaarinermillu siuarsaassaaq.

16 Pisuussutinik uumassusilinnik sumiiffikkaani uppernarsaasarnermit aqutsinermillu paasissutissat aaqqissuussaasutut ilusilimmi toqqortarisariaqarput. Paasissutissanik toqqortaqarnerup databasinut 'pitsaasumik periuseqarneq' malittariaqarpaa.

17 Sumiiffikkaani uppernarsaasarnermit aqutsinermillu paasissutissat sumiiffikkaani inuiaqatigiinnut tamatigut pissarsiarineqarsinnaasariaqarput.

18 Sumiiffikkaani uppernarsaasarnermit aqutsinermillu paasissutissanik atuinerit paasissutissaniittuni ilisarnaataasut killeqarfigisallu tamakku ataqqisariaqarpaat.

19 Isumalluutit uumassusillit aqunnissaannut attuumassuteqartutut paasissutissanik paasinninnerit misissueqqissaarinerillu sapinngisamik piaarnerpaamik suliarineqartariaqarput. Tamatuma paasissutissanik atuinermut periarfissat annertusassavai, taamaalisukkullu aalajangiinermik ingerlattakkanik siuarsaassalluni.

20 Sumiiffikkaani uppernarsaasarneq aqutsinerlu pillugit pilersitat nunami namminermi imaluunniit nunarsuarmi atugassarilikkatut pilersinneqarpata pilersitat nunaqarfinnut peqataasunut tamakkununnga ilisimasanik inerniliissutinillu uterteqqittarnissaat qularnaartariaqarpoq.

Sumiiffikkaani uppernarsaasarnerup aamma pisortatigut politikkip akornanni ataqatigiiffiit

21 Isumalluutit uumassusillit aqunnerinut, ilinniartitsinermut ilisimatusarnermullu pisortatigut politikki sumiiffikkaani uppernarsaasarnermit aqutsinermillu pinngortunik ilisimasanik ilanngussuinikkut pitsanngorsartariaqarpoq.

22 Sumiiffikkaani uppernarsaasarnerup aqutsinerullu aamma pisortatigut politikkip akornanni kalerreqatigiittarnermik pissutsinik peqartariaqarpoq: Teknikkikkut politikkikkullu aalajangiisarnermi sumiiffikkaanit uppernarsaassutinit ilisimasanik atuinermik sumiiffikkaani uppernarsaasarneq aqutsinerlu pillugit pilersitsiniutit kaammattuisariaqarlutillu siuarsaasariaqarput. Sumiiffikkaani uppernarsaasarneq aqutsinerlu pillugit ingerlatanik aalajangiisartut akuerinnittariaqarlutillu tapersersuisariaqarput.

23 Sumiiffikkaani inuiaqatigiit pilersitaattut ilisimasat tamakku sumiiffikkaani inuiaqatigiit avataanniillutik aalajangiisartut ataqqisariaqarlugillu atugariniartariaqarpaat. Taamatuttaaq sumiiffikkaani aalajangiinernut ilisimasanik taakkuninnga sumiiffikkaani inuiaqatigiit atuisarnerat ataqqisariaqarpaat.

24 Sumiiffikkaani uppernarsaanermit aqutsinermillu periutsit inernerisallu namminersortutut immikkoortoqarfimmut aamma inuiaqatigiinni immikkoortoqarfinnut allanut, soorlu suliffinnut mikisunut angisuunullu, aamma avatangiisini kingunerisinnaasanik nalilersuinerni peqataasutut kattuffinnut paasitsiniutigineqartariaqarput. Taamaalillutik immikkoortoqarfinni taakkunani allani, pisuussutinik uumasusilinnik sunniisunik imaluunniit pisariaqartitsisunik paasissutissat annertussusaat, paasiuminassusaat inooqatigiiffinnilu nakkutigineqarnerat pitsanngorsarneqassapput.

25 Avatangiisinut aamma isumalluutinut uumassusilinnut attaveqartuusuni ingerlattakkani politikkinilu sumiiffikkaani uppernarsaasarneq aqutsinerlu siuarsarneqartariaqarlutillu atorneqartariaqarput.

Inuiaqatigiinni pimoorussinermik akuerinninneq

26 Sumiiffikkaani uppernarsaasarnermi aqutsinermilu inuit ilaasut inernerisanik saqqummiuss-

inerminni piniartut aalisartullu ilalersuutaannik, isumaliortaatsikkullu piginnittuunerannik akuerinnittariaqarput. Assersuutigalugu sumiiffikkaani uppernarsaasarnermit aqutsinermillu inernerisanik tunngavilittut teknikkimut-ilisimatusarnermut saqqummersitani allattooqataatitsineq aqqutigalugu.

27 Sumiiffikkaani uppernarsaasarnermut aqutsinermullu peqataasunut akissarsiaqartitsinissaq pillugu apeqqut siamasissumik oqaluuserineqassaaq. Sumiiffikkaani inuiaqatigiiffimmik peqataasumik isumaqatigiissutigisaasumik sumiiffikkaani uppernarsaasarnermi aqutsinermilu peqataasut – aningaasaqarnikkut allatulluunniit – naapertuilluartumik naleqquttumillu najoqqutassialigaasumik akilerneqartassapput.

28 Sumiiffikkaani uppernarsaasarneq aqutsinerlu pillugit ingerlattakkanit peqqissaarussatut ineriartortitaasunit naammassineqarsimasutullu pilersitaasunik ilisimasanik tamakkuninnga naleqassuserisaq nunami namminermi, aamma nunani tamalaani ilisimatusarfiit akuerisariaqarpaat. Ingerlattakkanik taakkuninnga ilaqartitsilluni suleqatigiinnik ilisimatusarfiit pilersitsisariaqarlutillu siuarsaasariaqarput.

29 Kattuffiit aningaasaliisarnikkut pinngortitap allanngutsaaliorneranik, ilisimatusarnermik, teknikkikkut nutaaliornermik ilinniartitaanermillu tapersersuisut isumalluutit uumassusillit taakku atajuartinnissaannut pitsanngorsaanissamut, nunaqarfinnillu nukittorsaanissamut sumiiffikkaani uppernarsaasarneq aqutsinerlu siuarsartariaqarlugulu tapersersortariaqarpaat.

Sullissisarfinnik sumiiffikkaanilu inuiaqatigiinnik nukittorsaanerit

30 Sumiiffikkaani uppernarsaasarnerit aqutsinerillu tassaapput sumiiffinni inuiaqatigiit nukittorsarnissaannut sakkussat. Taamaattumik inooqatigiiffimmi naligiinngissutsimik annikillisaaqataasariaqarput. Aamma sumiiffimmi kultureqassutsimut naleqqukkaangata, aammalu sumiiffinni inuiaqatigiinnit pingaarnersiugaappata arnat, inuusuttut, aammalu eqimattukkuutaat avataaniilertitaasut ilanngussornissaannik siuarsaasariaqarput.

31 Inuinnaat sunniiniartut peqataanissaat qularnaarniarlugu sumiiffikkaani uppernarsaasarnerit aqutsisarnerillu sumiiffimmi inuiaqatigiit ineriartortitaanerannik nukittorsarnerannillu kammattuisuullunilu tapersersuisariaqarput. Aamma inooqatigiiffimmi ataqatigiissuseqassutsimik siuarsaaqataasariaqarput.

32 Sumiiffikkaani uppernarsaasarnermit aqutsinermillu inernerisanik tunngaveqartunik ilisimasat aalajangiussallu pillugit oqallinnermi inuit sumiiffikkaani uppernarsaasarnermi aqutsinermilu ilaasut nukittorsakkami inissisimaffeqalertariaqarput.

Sungiusarneq piginnaanngorsarnerlu

33 Sumiiffikkaani uppernarsaasarnermi aqutsinermilu sungiusarneq najoqqutassialikkatut ilinniagaqarnermik ingerlatat ilagisariaqarpaat. Sungiusarneq peqataasut kinaassusiinut assigiinngitsunut naleqquttariaqarpoq. Sumiiffikkaani uppernarsaasarnerup aqutsinerullu qanoq ililluni isumalluutit uumassusillit taakku nukittorsagaasumik aqutarinerinik siuarsaasinnaanerat sammineqartariaqarpoq.

34 Illua'tungerisat tamaasa akornanni sumiiffikkaani uppernarsaasarnermi aqutsinermilu ilaasuni isornartorsiusinnaassuseqarluni isumaliortaaseq sungiusarnerup siuarsartariaqarpaa. Isornartorsiusinnaassuseqarluni isumaliortaaseq ilisimasat pinngortinneqartut pitsaassusissaannik qularnaarinissamut pingaaruteqartuuvoq.

35 Inooqatigiiffimmut avatangiisinullu tunngasutut ajornartorsiutit sumiiffikkaani uppernar-

saasarnerup aqutsinerullu ingerlateqqinniagai sumiiffikkaani meeqqat atuarfiini taakkunani aamma killeqarfiusut qaangerlugit sammineqartussatut ilaasariaqarput.

36 Sumiiffikkaani uppernarsaasarneq aqutsinerlu pillugit suliarisassanut tapersersuinissamik pilersaarusiortoqarneratigut nunaqarfiit pisariaqartitaat sallerpaatillugit pingaarnersiortariaqarput. Siunissamut akunnattumik ungasissusilimmut aamma ungasissuusumut sumiiffikkaani uppernarsaasarnermik aqutsinermillu tapersersuiuartoqarnissamik pisariaqartitsisoqassasoq naatsorsuutigineqartariaqarpoq.

37 Sumiiffikkaani uppernarsaasarnermut aqutsinermullu aningaasatigut tapersersuisarneq sumiiffikkaani piviusuusunik sianiginnittariaqarpoq.

Paasisitsiniaaneq aamma attaveqaqatigiinneq

38 Sumiiffikkaani uppernarsaasarnermut aqutsinermullu ilitsersuutit atortussallu allat kikkunnit tamanit pissarsiarineqarsinnaasariaqarput.

39 Sumiiffikkaani uppernarsaasarnermit aqutsinermillu inernerisat tamarmik piniartunut aalisartunullu allanut, aamma avatangiisinik soqutigisalinnut, nunaqarfinnut allanut aamma tusagassiisarfinnut paasisitsiniutigisariaqarput. Aamma inernerisat ilisimatusartut ataatsiminnerini aamma inooqatigiiffinni attaveqarfiusuni saqqummiunneqartariaqarput.

40 Sumiiffikkaani uppernarsaasarneq aqutsinerlu aqqutigalugit ilisimasat sumiiffikkaaneersut, ileqqorisaasuneersut aammalu nunap inoqqaavisa pigisaat atorneqartut, imaluunniit pilersinneqartut, kikkunnit tamanit pissarsiassanngortinneqartariaqarput. Ilisimasanik tamakkuninnga piginnittut akornanni tamatumunnga akuersissuteqartarnissaq qularnaartariaqarpoq.

Brasilia, 1. juuni 2015*

*) 2022-mi kalaallisoortaa Kalaallit Nunaanni pissutsinut naleqqussagaavoq. Assersuutigalugu "participatory monitoring and management of biodiversity"-mut kalaallisoortaani taaguutigisaq "pisuussutinik uumassusilinnik sumiiffikkaani uppernarsaasarneq aqutsinerlu" atugaavoq. "Community"-mut taarsiussaavoq "piniartut aamma aalisartut, avatangiisinillu soqutigisallit allat", imaluunniit "nunaqarfik", apeqqutaalluni ataqatigiiffiusoq.

(ENGLISH VERSION)

Representatives of Indigenous Peoples, civil society, researchers and government decision-makers from 18 countries gathered in Manaus, Brazil, on 22-26 September 2014 to discuss and share experiences with community-based monitoring of natural resources. Among the participants were people from Greenland and Alaska. All shared a common desire to strength-

en community-based monitoring of natural resources. They would like to accelerate the uptake of community-based monitoring of natural resources among practitioners, scientists and civil society.

The Manaus Letter contains a number of recommendations for 'good practice' in community-based monitoring of natural resources. The recommendations are a result of the meeting in Manaus. The recommendations are general, and their relevance depends on the purpose of the individual initiatives and the special circumstances that exist in the individual areas.

Recommendations

Design of monitoring initiatives

1 Initiatives should be constructed from the bottom up, incorporating local as well as academic visions and knowledge.
2 Roles, responsibilities and institutional arrangements should be carefully identified via a thorough dialogue with the communities prior to beginning the initiative, considering the communities' capacities, needs and interests.
3 Monitoring targets should prioritize resources that are of local subsistence or economic value or in other ways meaningful to local people.
4 The methods and instruments used for monitoring should be easy to use, suitable, and appropriate to local practices and culture.
5 The designers of a participatory monitoring initiative must evaluate the potential positive and negative impacts associated with its implementation before starting it, keeping in mind that the benefits may not compensate for the associated workload and governance issues and therefore implementation may not be desirable.
6 Whenever possible, new initiatives should build on existing local initiatives rather than replacing them.
7 Data gathered should contribute to decision making on resource use, territorial management, socio-environmental policies at different scales, or other objectives that are jointly agreed on.
8 The monitoring initiative's methods, governance structure, data produced, and use of information for management should be regularly reviewed in order to make any necessary adjustments.

Community participation in monitoring initiatives

9 Community members involved in monitoring should be selected by the communities themselves supported by their partner organizations considering their responsibility, capacity, commitment and experience.
10 The role of community actors in decision making for territorial management and resource use can be enhanced through the promotion of broad community participation in all aspects of monitoring initiatives and implementation of regular community meetings to disseminate, review and value the information produced.

Institutional arrangements and partnerships

11 The participation of diverse social actors is necessary for the success of participatory monitoring initiatives; partnerships and multi-institutional arrangements should be formalized before implementation of the initiatives.

12 Monitoring initiatives must reconcile and balance the interests and motivations of local, regional and global actors involved in the initiative; mutual trust among these actors is essential for success. Relationships must be transparent, initiative construction and design must include realistic expectations from all partners, and initiative objectives must be clear and consider the interests of all actors.

Data quality and management

13 Data quality is fundamental if participatory monitoring of biodiversity is to achieve its objectives; it is therefore essential that data collection be standardized at the necessary scales (among monitors, among communities, and among initiatives if the scale of monitoring is regional or global).

14 Data quality can be ensured by several mechanisms, including continuous training of persons involved in data collection, data quality assessment by researchers and community members, effective community involvement in all aspects of monitoring, and collective understanding and social control by the community. Additionally, community leaders participating in the project should be responsible for verifying data integrity.

15 When feasible, recognized statistical analysis or data filtering systems should be used to prevent the accumulation of errors in monitoring databases and ensure objectivity and standardization in data quality.

16 Data from biodiversity monitoring should be stored in a systematic manner using best practices of data base management.

17 Participatory monitoring data should always be available to local communities

18 Use and application of monitoring data should respect the characteristics, limitations and restrictions inherent in the data.

19 Data interpretation and analysis that are relevant for local management should be carried out as quickly as possible, with the participation of local actors, in order to accelerate and facilitate data use in local decision-making.

20 When monitoring initiatives are designed for use at the regional or global scale, they should ensure the return of information and results to participating local communities. Communication mechanisms must be in place in these larger scale initiatives to guarantee community access to information and transference of knowledge, ensuring that information can and will be in fact returned.

Relationship between monitoring initiatives and public policy

21 Public policies on natural resources management, education, and territorial management should be improved by incorporating information derived from participatory monitoring.

22 There should be a feedback relationship between participatory monitoring initiatives and public policies: the initiatives should stimulate and promote the use of monitoring results in technical and political decision making, and decision makers should recognize and support processes of participatory natural resource monitoring.

23 Non-community decision-makers should respect and use the information generated by

communities and the way in which communities use this information for local management.

24 Participatory monitoring approaches and information should be disseminated to other enterprises and sectors of society that are not organized into community-based governance systems, such as small and large landowners, the private sector, and agencies involved with environmental impact assessments, thus bringing the benefits of scale, transparency and social control to these other sectors that impact and/or depend on biodiversity and natural resource use.

25 Participatory monitoring should be promoted by and applied in programs and policies linked to environmental services.

Recognition of community involvement

26 The entities involved in participatory monitoring should recognize the contribution and intellectual property of the community in the publication of materials, for instance through co-authorship in technical-scientific works that are based on or include community efforts, when this is of interest to the community and appropriate for the publication, seeking when possible to shift current publication customs and practices of journals and publishing houses.

27 The issue of remuneration for participatory monitoring must be broadly discussed by all stakeholders; community agents involved in monitoring initiatives must be formally compensated – financially or not – in a fair and appropriate manner agreed to with the participating community.

28 National and international research institutions should recognize the current and potential value of information generated by well designed and implemented participatory monitoring and should more often establish and promote partnerships for participatory monitoring.

29 The funding agencies for conservation, research, technological innovation and education should promote and support participatory monitoring as a mechanism to enhance biodiversity conservation and community empowerment.

Institutional and community strengthening

30 Recognizing that participatory monitoring is one mechanism for community strengthening, participatory monitoring initiatives should promote the reduction of local social inequalities, in particular stimulating the involvement of women and youth and other marginalized groups when appropriate to the local culture and when prioritized by the communities.

31 In order to guarantee grassroots participation, participatory monitoring initiatives should stimulate and support the development and strengthening of community and social organization, ensuring social cohesion and effective participation in the initiatives.

32 Local community monitoring groups should be strengthened to enhance their role in discussions of information and decision making based on participatory monitoring results.

Capacity building

33 Capacity building for community involvement in participatory monitoring must be included in formal education programs. Such capacity building should address the needs of the diverse social actors that participate individually and collectively (including community organizations) in monitoring and management, emphasizing the relationship of monitoring to environmental and territorial management and to the development and social control of public policies.

34 Education processes should address improvements in critical thinking for all actors involved in participatory monitoring; such education is as important as technical training to ensure the quality of the information generated by participatory monitoring.
35 The social-environmental issues addressed by participatory monitoring initiatives should be included as crosscutting themes in local public schools.
36 When designing for support of monitoring activities, actions that respond to community concerns should be prioritized, foreseeing the need for continuous support to increase the sustainability of the initiatives in the medium and long term and enable adaptive management.
37 The financial support of participatory monitoring initiatives should consider financial arrangements and mechanisms of implementation appropriate to local realities of participatory monitoring activities.

Systematization, dissemination and communication

38 Methodologies and materials for participatory monitoring, including species identification guides, information management systems and best practices in monitoring and management should be made broadly available.
39 All stages and results of monitoring initiatives should be disseminated among communities, in the press, in scientific meetings, and through social networks.
40 Local, traditional and indigenous knowledge used in and produced by biodiversity monitoring should be systematized and made publicly available, ensuring that there is consent among the knowledge holders.

Brasília, 1st June 2015

6. Summary in Greenlandic

EU CAPARDUS-ip suliniutaata, aamma UArctic "Thematic Network on Collaborative Resource Management"-ip pisuussutinik uumassusilinnik tamakkuninnga aqutsisarnermik ilisimatitsisarnissamut sumiiffikkaanit ilisimatusartuusunillu ilisimasat atugarisarneri pillugit isumasioqatigiinneq aaqqissuuppaat. 2022-mi ulluni 29. novembarimit 2. decembarimut Kalaallit Nunaanni Qeqertarsuup Tunuata sineriaata eqqaani Aasianni Aasiaat Katersortarfianni Qassimi isumasioqatigiinneq ingerlanneqarpoq. Peqataasut tassaapput aalisartut aamma piniartut, pisortaqarfiusuni aalajangiisartut, pinngortitami pisuussutinik aqutsisuusut, inuiaqatigiinni kattuffinnit sinniisut, aamma inuiaqatigiinni aamma pinngortitami ilisimatusarfiit iluinit ilisimatusartut. Siunertaq tassaasimavoq pisuussutit uumassusillit pillugit aalajangiisarnermik ilisimatitsisarnermut siunissami sumiiffikkaanit ilisimasat qanoq ililluti ilalersuuteqartarnissaannik, sumiiffikkaanit uppernarsaasarnerup aqutsinerullu aningaasaliiffigisatut aaqqissuussaasutullu piujuartitsisarnerup qanoq ililluni qularnaarneqarsinnaassaneranik, aammalu atuisartut aamma ilisimatusarfiusunit ilisimasat qanoq ililluti attavilerneqarsinnaanerannik oqallinnissaq. Isumasioqatigiinneq pisuussutinik uumassusilinnik sumiiffikkaanit uppernarsaasarnermut aqutsisarnermullu nunarsuarmi 'periutsinut pitsaasunut' najoqqutassanik ineriartortitaqarnissamut ilalersuivoq.

Isumasioqatigiinnermi sammisat arlallit pillugit isumaqatigiittoqarpoq:
1) Aallarniutitut pilersitat, Kalaallit Nunaanni pisuussutinik uumassusilinnik killiffigisanik nikik-

kiartornernillu aalisartut piniartullu malittarinnillutillu ilisimasanik tamakkuninnga aalajangiisartunut agguaassisarsimanerat misilittakkanik iluaqutaasunik tunniussaqarsimasut.
2) Aallarniutitut pilersitat ingerlateqqinneqartariaqartut, aammalu suli annermik aaqqissuunneqarlutillu pingaarninngortittariaqartut, aammalu inatsisaasunit tapersersorneqassasut.
3) Aalajangiisarnermik ilisimatitsiniarluni atuisartut ilisimasaasa akuersaakkatut naleqquttumik ilisimatusarnikkut ilisimasanut atassusilernissaannut aaqqissuussaasumik attaveqarfissamik pilersitsisoqartariaqartoq.
4) Suliarisami tassani peqataaqataasunut aalisartunut piniartunullu taakkununnga, aammalu suliarisaannut aaqqissuussaasutut toqqammavigisanut tamakkununnga aningaasatigut pisassanik qularnaarisoqartariaqartoq.

Isumasioqatigiinnermi aamma Kalaallit Nunaanni isumalluutinik aqutsinermi atuisartut ilisimasaannik ilanngussuinermik tapersersuisussamik suleqatigiissitaliortoqassasoq aalajangiunneqarpoq ("Arbejdsgruppen for Handling om Involvering af Brugerviden i Ressourceforvaltning i Grønland" ("Kalaallit Nunaanni Isumalluutinik aqutsinermi Atuisartut ilisimasaannik Ilanngussuineq pillugu Periuseqarnissamut Suleqatigiissitat"). Aamma qaammatini takkuttussani peqatigiilluni "Manaus Letter: Recommendations for the Participatory Monitoring of Biodiversity" ("Manaus'imit allagaq: Pisuussutinik uumassusilinnik sumiiffikkaani uppernarsaasarnermut aqutsinermullu inassutigisat") nutarternissaa aalajangiunneqarpoq. Kiisalu nunarsuarmi isumaqatigiissutip nutaap, Kunming-Montréal Globale Biodiversitetsramme (Kunming-Montréalimi Nunarsuarmi Uumassusillit Assigiinngisitaarnerinut Toqqammavissaq) pillugu oqallinnernut ilalersuuteqarniarluni isumasioqatigiinnermit inerniliussat Konventionen om Biologisk Mangfoldighedip (Uumassusillit Assigiinngisitaarneri pillugit Isumaqatigiissutigisap) Allattoqarfianut nassiunneqarput. Isumasioqatigiinnermit saqqummiussat tamarmik kikkut tamarmik pissarsiarisinnaavaat ugguuna: link. Isumasioqatigiinneq EU'p Horizon 2020-mi ilisimatusarnermut nutaaliortarnermullu ingerlatarisaa, aamma Styrelsen for Forskning og Videregående Uddannelser (Ilisimatusarnermut Nangitsillunilu Ilinniagaqarnernut Aqutsisoqarfik) aqqutigalugu UArcticimit aningaasaliiffigineqarpoq.

7. Summary in Danish

EU CAPARDUS-projektet og UArctic "Thematic Network on Collaborative Resource Management" organiserede en workshop om brugen af lokal og videnskabelig viden til at informere forvaltning af de levende ressourcer. Workshoppen blev afholdt i Aasiaat Forsamlingshus i Aasiaat ved kysten af Disko Bugt, Grønland, fra den 29. november til den 2. december 2022. Deltagerne var fiskere og fangere, offentlige beslutningstagere, naturressourceforvaltere, repræsentanter for civilsamfundsorganisationer, og forskere indenfor samfundsvidenskab og naturvidenskab. Formålet var at drøfte, hvordan lokal viden i fremtiden kan bidrage til at informere beslutningstagning om levende ressourcer, hvordan den finansielle og organisatoriske bæredygtighed af lokal dokumentation og forvaltning kan sikres, og hvordan brugerviden og videnskabelig viden kan forbindes. Workshoppen bidrog til udvikling af globale 'god praksis'-retningslinjer for lokal dokumentation og forvaltning af levende ressourcer.
Der var enighed om flere emner på workshoppen:
1) At pilotinitiativerne, hvor fiskere og fangere i Grønland har fulgt de levende ressourcers status og tendenser og delt denne viden med beslutningstagere, har givet nyttige erfaringer.
2) At pilotinitiativerne bør videreføres og yderligere tilrettelægges og opskaleres, og at de skal understøttes af lovgivning.
3) At der bør etableres en systematisk tilgang til at forbinde brugerviden med konventionel videnskabelig viden for at informere beslutningstagning.
4) At der skal sikres økonomiske midler til de fiskere og fangere, der er engageret i dette arbejde, og til de organisatoriske rammer for deres arbejde.

Desuden blev det på workshoppen besluttet at nedsætte en arbejdsgruppe, der skal understøtte inddragelsen af brugerviden i ressourceforvaltningen i Grønland ("Arbejdsgruppen for Handling om Involvering af Brugerviden i Ressourceforvaltning i Grønland"). Det blev også besluttet i fællesskab at opdatere "Manaus Letter: Recommendations for the Participatory Monitoring of Biodiversity" i de kommende måneder. Endelig blev konklusionerne fra workshoppen sendt til Sekretariatet for Konventionen om Biologisk Mangfoldighed for at bidrage til drøftelserne om den nye globale aftale, Kunming-Montréal Globale Biodiversitetsramme. Alle præsentationerne på workshoppen er offentligt tilgængelige på dette link. Workshoppen blev finansieret af EU's Horizon 2020 forsknings- og innovationsprogram og af UArctic gennem Styrelsen for Forskning og Videregående Uddannelser.

Towards "good practice" in the use of local and scientific knowledge for informing natural resource management

Report from workshop
Aasiaat - Greenland
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