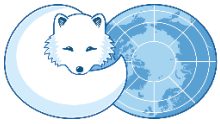

Arctic Council SAO plenary meeting
1-2 November 2018, Rovaniemi, Finland
Meeting code: SAOFI203

Document Title

Report of the 1st Arctic Resilience Forum, 10-11 September 2018 in Rovaniemi, Finland

Agenda item number

6

Submitted by

Chairmanship

Document filename

SAOFI203_2018_ROVANIEMI_06_Resilience-Forum-Report

Number of pages, not including this cover sheet

52

If we lose the Arctic, we lose the world

Report of the 1st Arctic Resilience Forum, 10-11 September 2018 in Rovaniemi, Finland

DRAFT 22.10.2018

Mikko Halonen and Susanna Sepponen, October 2018
Gaia Consulting Ltd

TABLE OF CONTENTS

Executive summary

The 1st Arctic Resilience Forum, which was organized 10-11 September 2018 in Rovaniemi, Finland, helped to form a better understanding of the opportunities for cooperation connected to Arctic resilience. The Forum showcased concrete best practices in the region with a focus on encouraging mutual learning and inspiring concrete, accelerated actions for strengthening climate resilience in the Arctic.

The two-day Forum gathered nearly 100 Arctic experts, policymakers, and various key stakeholders, with representatives from the Arctic Council States, Working Groups, Permanent Participants, and Observers; national, regional and local government; indigenous organizations; academia; industry; and non-governmental organizations; as well as local youth that participated in a side event.

The Arctic Resilience Action Framework (ARAF), adopted by the Arctic Council Ministers in the Fairbanks Declaration (May 2017), provided a valuable structure for the discussions. The discussions sought to produce a joint understanding of how to operationalize resilience and catalyze funding for action in an extremely vulnerable, rapidly changing as well as culturally, socio-economically and environmentally diversified region.

During the 1st Day, around twenty international keynotes and commentary presentations were delivered around the four ARAF priority areas: analyzing and understanding risk and resilience; building resilience and adaptation capacity; implementing measures that build resilience through policy, planning and cooperation; and encouraging investment to reduce risk and build resilience.

During the 2nd Day, representatives of the Arctic Council Working Groups presented cases of their resilience related work, showcased good practices and lessons learned as well as highlighted opportunities for strengthening resilience. Building upon the working group presentations, breakout sessions were formed to identify further opportunities to accelerate Working Groups' resilience-related work and enhance collaboration between other Arctic stakeholders. Additional breakout sessions highlighted good practices of local stakeholders in the Finnish Arctic.

The Arctic Resilience Forum resulted in several key takeaways:

1. **There is a wealth of information, expertise, and experiences in building resilience across the Arctic that should be actively shared**

The forum highlighted the existence of a wealth of information and expertise as well as already existing experiences in building climate resilience that can and should be actively shared and learnt from. In particular, Arctic indigenous peoples have long histories and experiences with adapting to changes in the Arctic. While noting the leadership and mandates of the Arctic Council and its Working Groups, the forum highlighted also the need to build partnerships across all relevant stakeholders in the Arctic.

The need for cooperation in environmental monitoring, sharing data, making climate information more user-friendly and building bridges between scientific climate and indigenous knowledge were recurrent themes during the two-day forum. The forum provided ample examples of how these needs can be addressed and allowed participants to identify potential new partnerships for doing so.

2. **There are several challenges in the sustainable and equitable management of natural resources in the Arctic, which are compounded by climate change**

The forum also noted major challenges in sustainable and equitable management of natural resources. Climate change will increase pressures on natural resources and strengthening resilience will require improved capacities to deal with and reconcile these pressures. The forum highlighted that local participation, transparency and mutual respect are obligatory ingredients for reconciling conflicting interests in a sustainable manner.

3. **Climate change resilience should be dealt with in the context of sustainable and inclusive development at all levels (i.e., local, national, regional)**

The forum noted the multiple climate risks posed on Arctic livelihoods, including agriculture, forestry, fishery, food production, tourism, herding, etc. and the need to strengthen the resilience of these livelihoods. In some cases, the change caused by climate change in the physical environment is already so dramatic and unavoidable that transformation of livelihoods remains the sole option. The forum also highlighted critical aspects of human well-being and health as well as awareness and capacity, through examples related to health impacts caused by climate change as well as the need to transform education. The forum strongly identified a need to climate screen and proof all investments in the Arctic, to reduce and manage risks caused by climate change.

However, there were strong opinions about dealing with climate change as a separate issue of its own. It was recommended that addressing climate change must be dealt with as part of sustainable and inclusive development at the local, national and regional Arctic level.

4. **Building resilience in a way that meets the urgency of climate change requires partnerships across the Arctic region and other regions of the world. Effectively building resilience requires engagement of multiple stakeholders, including scientists, policy makers, indigenous peoples, the private sector and civil society**

Finally, the forum stressed the need for partnerships. There are opportunities to expand partnerships across the circumpolar Arctic and across different types of stakeholders. There are also opportunities to form partnerships with stakeholders in other regions of the world and make use of their experiences with building resilience, especially in accessing resources and funding. Currently, there are limited investments in building resilience in the Arctic, however, other regions of the world could offer lessons learned that could be applied to and scaled up in the Arctic.

The 1st Arctic Resilience Forum was organized by the Ministry of Agriculture and Forestry of Finland in cooperation with the Ministry of Foreign Affairs of Finland and the Arctic Resilience Action Framework's (ARAF) Implementation Team, and with support from the Arctic Council Secretariat and inputs from the Arctic Council Working Groups.

Tiivistelmä

Čuákánkiäsu

Sammanfattning

Резюме

Background and Introduction

1.1 The context and overall objectives of the Forum

The level of awareness as well as overall readiness for addressing climate and other environmental changes and their linkages to human development has markedly increased in recent years. This has been demonstrated, among other events, by the adoption of the Sendai Framework for Disaster Risk Reduction in March 2015, the adoption of the 2030 Agenda and its Sustainable Development Goals (SDGs) in September 2015, and the Paris climate agreement of December 2015. Each of these speaks to the importance of strengthening the resilience of vulnerable communities and ecosystems. Building on these global agreements, numerous regional bodies, as well as national bodies around the world are adopting frameworks and strategies to adapt to climate change and build resilience. Simultaneously, while numerous local communities are struggling to cope with the very tangible impacts of a changing climate, efforts to more proactively build resilience are taking shape.

The changes happening in the Arctic today are driven primarily by external factors. Climate change is the most pervasive and powerful driver of change, but many other environmental changes are taking place as well, alongside rapid social and economic developments. In some contexts, factors such as resource demand, transportation needs, migration, geopolitical changes and other changes linked to globalization are making the greatest impact on the Arctic. Indeed, many Arctic social-ecological systems face multiple stressors simultaneously (Arctic Resilience Report, 2016).

The aim of the first Arctic Resilience Forum was to develop a better understanding of the opportunities for cooperation connected to Arctic resilience and to showcase and learn from good practices already in place or underway in the region, with a focus on climate resilience.

While slowing Arctic change and building resilience are crucial for the people and ecosystems of the Arctic, there is ample evidence that Arctic social and bio-physical systems are deeply intertwined with our planet's social and biophysical systems. This has sometimes been phrased as "what happens in the Arctic doesn't stay in the Arctic", or in the words of Finnish President Sauli Niinistö "If we lose the Arctic, we lose the whole world".[1]

The 1st Arctic Resilience Forum was organized in Rovaniemi 10-11 September 2018 as a part of the **2017-2019 Finnish Chairmanship Program of the Arctic Council**, by the **Ministry of Agriculture and Forestry of Finland** in cooperation with the Ministry of Foreign Affairs of Finland. The program was prepared in close cooperation with the **Arctic Resilience Action Framework's (ARAF) Co-Leads and Implementation Team**

[1] President Niinistö in Arkhangelsk, Russia on 30 March 2017

(listed at the end of this report) and with support from the **Arctic Council Secretariat** and inputs from the **Arctic Council Working Groups** (see section 1.3).

1.2 Arctic Resilience Action Framework

The Arctic Resilience Action Framework (ARAF) provided an overall guiding framework for the forum discussions. While only recently adopted, it allowed for structured discussions and to develop a shared understanding of how to operationalize resilience in an extremely vulnerable and rapidly changing, as well as culturally, socio-economically and environmentally diverse region.

The ARAF was adopted by the Arctic Council in the Fairbanks Declaration (May, 2017). The ARAF proposes a common set of resilience building priorities for the Arctic States, Permanent Participants, Working Groups, and Observers. The four priority areas are i) Analyzing and Understanding Risk and Resilience in the Arctic; ii) Building Resilience and Adaptation Capacity, iii) Implementing Measures that Build Resilience through Policy, Planning and Cooperation; and iv) Encouraging Investment to Reduce Risk and Build Resilience. By adopting the ARAF, the Arctic Council has also agreed to track its existing activities that address the ARAF priorities.

The concepts of resilience and climate adaptation

Resilience in ecosystem terms is the ability of a system to bounce back and thrive during and after disturbances and shocks. Resilience of people or communities is often described as the ability to organize, define ambitions and goals, and chart a course forward under changing conditions. This social resilience is linked to the ecosystems upon which people depend. The Arctic region is changing rapidly, and the speed of ongoing change makes adaptation extremely urgent as well as challenging. Governments, indigenous peoples, local communities, researchers, and businesses must work together to build resilience to the social-ecological changes that are underway. Resilience is closely linked with **climate adaptation**, which is an adjustment in natural or human systems in response to climate change, which is intended to minimize disruption or take advantage of opportunities. Implementing effective climate adaptation measures can build resilience, and actions fostering resilience can build the capacity to adapt. For this reason, resilience and climate adaptation are closely linked and often described in commensurate terms.

To understand changes in the Arctic and to identify and implement strategies for adaptation and resilience, it is important to consider the linked social-ecological system. A social-ecological system is an integrated system that includes human societies and ecosystems. Its structure is characterized by reciprocal feedbacks. In the Arctic, social and ecological systems are particularly linked.

Source: ARAF, 2017

Implementation of the ARAF aims to collect, share and inspire action by the Arctic States, Permanent Participants, Working Groups, and Observers around the four ARAF priorities, share best practices for building resilience in the region, and identify ways to measure progress towards building resilience in the region, including identifying gaps and challenges. The Forum preparations (see section 1.3 below) and program were organized to actively support bridging of knowledge, expertise and capacities of different stakeholders, while recognizing

that strengthening resilience in the Arctic region will require partnerships and sharing of good practices and lessons learned – among stakeholders in the Arctic and beyond.

The initial phase of ARAF 2017-19 is being implemented under the Arctic Council **Sustainable Development Working Group (SDWG),** in coordination with all other Working Group Secretariats. The ARAF is the continuation of a project of the U.S. Chairmanship (2015-2017) and of the Arctic Resilience Report, co-chaired by Sweden and the U.S.

Convening the Arctic Resilience Forum in Rovaniemi was a central part of ARAF implementation. In addition, the Forum served as a catalyst to collect and share actions that Arctic States, Permanent Participants, Working Groups, and Observers are taking (or will take) to address the ARAF priorities; and developing an inventory of existing and emerging measurement protocols – including self-assessment protocols – as well as existing and emerging indicators, in order to measure and compare progress building Arctic resilience over space and time.

1.3 Preparing the 1st Arctic Resilience Forum

The preparations for the Forum included issuing a background study on Arctic resilience in Finland, collecting best practice examples from the whole Arctic region, and dialogue with Arctic Council Working groups, as well as with key (national and local) stakeholders in Finland. The preparations were supported by the Arctic Council Secretariat and a team of project co-leads representing the U.S., Sweden and Finland, and, as well as **Gaia Consulting Ltd**, which also provided moderation support to the Forum.

1.3.1 Background Study on Arctic climate resilience in Finland

As part of the preparations for the Arctic Resilience Forum, the Ministry for Agriculture and Forestry issued **a pre-study** on best practices of Arctic resilience in Finland[2]. It was conducted by the **Arctic Centre of the University of Lapland**, in cooperation with Gaia Consulting. While the pre-study draws from the **Arctic Resilience Report** and other related key publications, it has a focus on climate resilience, highlighting resilience strengthening actions in Finland.

1.3.2 Collecting good practices from the Arctic region

Cases of good practices of Arctic resilience from Finland were presented in the pre-study and used to encourage gathering of similar cases from other Arctic stakeholders. The Finnish cases were distributed to Arctic Council States, Permanent Participants and Working Groups through an interactive online platform[3] where representatives of more than 50 Arctic Council stakeholders were provided access. The Arctic Council Secretariat coordinated the collection

[2] Koivurova, Timo & Kähkönen, Juho (2018). Pre-Study for the Arctic Resilience Forum 2018. http://urn.fi/URN:ISBN:978-952-337-095-1
[3] REAL, provided by Humap Software

of good practices from the whole Arctic region. Numerous cases were provided by Arctic States, Permanent Participants and one Observer (IASSA), serving the Forum preparations. The complete list of 44 collected cases as of the time of the Forum can be found in **Annex 4** to this report and can serve as basis for follow-up.

1.3.3 Dialogue with Arctic Council Working Groups

The Resilience Forum was organized in close cooperation with the Co-Leads of the ARAF project[4], as well as all Arctic Council Working Groups. A discussion on resilience in Working Group projects was organized in connection with the Senior Arctic Officials meeting and the meeting of the Sustainable Development Working Group in Levi, Finland in March 2018. It was noted that all six of the Arctic Council Working Groups are already taking actions that build resilience and they are also aware of the need to accelerate further action to help build climate resilience. At Levi, the Working Groups agreed to collect and submit examples of actions drawn from their 2017-2019 Work Plans. Projects implemented in conjunction with multiple Working Groups and projects of potential relevance for multiple Working Groups were specifically highlighted. These projects were specifically highlighted, in part, because a resilience approach is cross-cutting and multi-disciplinary, and projects implemented across multiple Working Groups have a greater potential to incorporate diverse types of knowledge. Working Groups have since proposed additional or strengthened collaborations that could build resilience. For an overview of these suggested collaborations, coordinated by the Arctic Council Secretariat, see **Annex 3** to this report.

1.3.4 Dialogue with stakeholders in Finland

The Arctic Resilience Forum was organized in cooperation with key stakeholders in Finland. In addition to the **Ministry of Agriculture and Forestry** and the **Ministry of Foreign Affairs**, the conference committee included expertise from the **Ministry of the Environment**, and the **Ministry of Education and Culture**. As noted above, the Forum was organized under the umbrella of the 2017-2019 Finnish Chairmanship Program of the Arctic Council. The initial findings from the Pre-Study on Arctic Resilience in Finland were presented and discussed at a dialogue meeting with Arctic stakeholders in Finland on 7 February 2018, in Helsinki, hence contributing to finalization of the pre-study as well as Forum preparations.

1.4 Forum participants and structure of report

The 1st Arctic Resilience Forum gathered nearly 100 Arctic experts, policymakers, and various key stakeholders, with representatives from the Arctic Council States, Working Groups, Per-

[4] Sarah Abdelrahim (US), Marcus Carson (SE) and Saara Lilja-Rothsten (FI)

manent Participants, and Observers; national, regional and local government; indigenous organizations; academia; industry; and non-governmental organizations; as well as local youth that participated in a side event.

The Forum was organized as a 2-day event at **the Science Centre Pilke** in Rovaniemi, in cooperation with the **Science Centre Arktikum. Metsähallitus**, the enterprise administering state-owned land and water areas in Finland, organized a forest excursion in Jäkälänselkä forest, focusing on principles and methods of sustainable forestry, and climate action in climate-smart forestry and logistics. **The first day** was an open Forum for exchanging and discussing good practices in resilience across the Arctic region (chapter 2). Each session concluded with a panel discussion, where the keynote joined the other session speakers for a moderated discussion, also opened the floor for interactive sharing of experiences and good practices. **The second day** of the Forum continued to share experiences and lessons learned for operationalizing climate resilience in the Arctic, highlighting approaches and experiences of the Arctic Council Working Groups (chapter 3). Some of the key outcomes and suggestions for follow-up are highlighted in chapter 4.

Annex 1 presents the program of the Forum with links to presentations provided during the Forum. **Annex 2** includes the biographies of the speakers. **Annex 3** outlines actions and projects suggested by the Arctic Council Working Groups, while **Annex 4** presents examples of building resilience in Arctic regions – cases submitted by Arctic States, Permanent Participants, Observers and other Arctic stakeholders in the run-up to the Forum.

Good practices and tools in Arctic Resilience - Day 1 summary

1.5 Setting the stage for the Forum (Opening Session)

The Forum was opened by **Jaana Husu-Kallio, Permanent Secretary of the Ministry of Agriculture and Forestry, Finland**, and member of the Finnish Arctic Advisory Board. In her opening speech, Husu-Kallio emphasized resilience as a common denominator for the three central international agreements to battle global warming: the 2030 Agenda, the Paris agreement, and the Sendai Framework for Disaster Risk Reduction. The stewardship of local people, the livelihoods of the North, as well as education, scientific research and technological capabilities all provide important building blocks for Arctic resilience. Husu-Kallio pointed out that there is no time to lose because some of the changes may take place surprisingly fast. The better foresight we have in developing new climate resilient solutions and management of weather and climate risks, the less costly will the future be for us. The Arctic Resilience Action Framework, developed by the Arctic Council, provides a useful way of framing the exchange of good practices and mutual learning that is expected from the Forum, and urged the participants towards active participation and exchange.

1.5.1 On climate resilience and Arctic communities (Gunn-Britt Retter)

Drawing on her own home community, Gunn-Britt Retter, Head of the Arctic and Environment Unit, Sámi Council, highlighted in her speech how the Sámi people have always adapted to change. Indigenous Peoples' communities across the Arctic share similar kinds of societal structures based on horizontal (family based) governance systems, a type of knowledge that springs from a close relationship to nature and a semi-nomadic lifestyle. These systems, which have flexibly adapted to change, are now challenged by formal government structures based on administrative levels and policy implementation that often fails to take account of context. In addition, the land has become more fragmented by other uses, and indigenous communities are no longer living in isolation. In addition, rapidly warming temperatures due to climate change are remaking the Arctic landscape in ways never before seen. We need to learn from each other how to secure resilient communities that can adapt to inevitable changes. Retter concluded by citing Prof. Kirsten Hastrup at the closing session of the UArctic conference 2018 in Helsinki, "we have to work along with the changes". We need to adapt to those changes that we cannot do anything about, and learn from the flexibility of Arctic communities.

1.5.2 Resilience and new directions for Arctic development (Sverker Sörlin)

In his keynote, **Prof. Sverker Sörlin from the KTH Royal Institute of Technology** discussed the concept of resilience from the notion that prediction is becoming increasingly difficult. In a social context, resilience is about things we are familiar with, and related to trust, resources, and a healthy society overall. Originally developed within ecology, the idea has expanded and been integrated with other concepts, such as sustainability, planetary boundaries, tipping points, and concepts of environment. Sörlin pointed to the Arctic Resilience Report, which was a very ambitious and challenging project, and which resulted in a comprehensive understanding of what is going on in Arctic areas. In the Arctic Resilience Action Framework (ARAF),, the interconnection between resilience and related climate and sustainability concepts is inevitable, although interestingly enough the ARAF itself does not once mention terms such as the Anthropocene, fossil fuels, sustainability, transition or well-being. Because the resilience concept focuses heavily on the interconnectedness of social and ecological systems, Sörlin stated that resilience pushes us to think "outside the box".

Sörlin presented changing concepts and attitudes towards resilience. One example is the formal and informal heritage processes for Arctic post extraction societies and the building of new attitudes towards responsible resource extraction, studied in the REXSAC project on Arctic mining societies.

Sörlin also pointed out that ice is a highly political subject, in some cases protected by environmental laws. Greening of the Poles can refer to ecological, or to political greening, as can be the case of some of the numerous nature reserves created in the North during the last years. Another example of the high political appeal of ice is illustrated by the turbulence around 'feminist glaciology' in 2016. It shows how the human research on ice is changing. Another example

is the acknowledgement of cooperation with the local communities in sciences, which actually was there already 100 years ago, but not recognized until recently. With regards to operationalizing resilience, Sörlin highlighted the diversity of knowledge from many fields that needs to be linked up. Meanwhile, there is a lot to learn from previous politics and interventions, a need to broaden our understanding of what we know. Most people in Arctic research and local Arctic communities are engaged in resilience, but it is important to remember that climate change was on the agenda already in the 50's. There is an entire generation of researchers and people raised into this reality, and in this respect the Arctic Resilience Action Framework is unnecessarily timid. We need to talk more about agency, specifically on the grassroot level. The urgent question is how to make real progress for sustainability and livability of Arctic regions.

1.6 Analyzing and Understanding Risk and Resilience in the Arctic (Session 1)

1.6.1 "Weather is the boss" – meteorological services and cooperation in the Arctic (Juhani Damski)

Prof. Juhani Damski, Director General of the Finnish Meteorological Institute, gave a keynote on the importance and possibilities of Arctic meteorological services and cooperation. Risks related to climate change are among the highest risks according to World Economic Forum analyses, and Arctic areas are warming faster than any other area in the world. Recent analyses also show that we are not reaching the goals of the Paris agreement in climate mitigation, therefore more efforts need to be put in adaptation measures. Climate change in the Arctic area has far reaching impacts globally, and we need to recognize that weather is affecting everything, "weather is the boss". We need strategic infrastructure to better forecast and understand the weather, need to enhance our Arctic monitoring capabilities of atmosphere, cryosphere and oceans, which also requires enhanced scientific collaboration, data sharing, exploration of new sustainable technologies, and stronger customer orientation. Damski also highlighted the need to provide good services to politicians, civil servants, investors, and local community, and the need to strengthen the link between science and indigenous (local) knowledge. Damski stressed that meteorological cooperation is one of the priorities of the Finnish chairmanship. There are a lot of practical on-going efforts related to knowledge development that can be further advanced to protect our Arctic heritage.

1.6.2 Integrating resilience and sustainable development in a pan-Arctic concept (Tatiana Vlasova)

Dr. Tatiana Vlasova, Institute of Geography, Russian Academy of Sciences, elaborated on the benefits of integrating resilience theory with the UN concept of Sustainable Development Goals (SDG). While the SDGs are better known to national decision makers and in global fora, resilience can help put focus on how goals and targets function in specific Arctic features. These include e.g. how Arctic climate change affects Indigenous Peoples, whose tra-

ditional livelihoods are closely interrelated with climate and environment, with a special attention on "mixed and subsistence economies", or community flexibility. Integrating resilience building with SDGs will enable a better monitoring of the sustainability of Arctic socio-ecological systems. One suggestion is to create a pan-Arctic sustainability monitoring network on the basis of multiple existing stakeholders, such as ARAF, the Sustainable Development Working Group, the Cold and High Altitude Regions Commission of the International Geographical Union (IGU-CHAR), the Arctic resilience collaborative research projects of Belmont Forum, as well as the International Arctic Social Sciences Association (IASSA), Inter-Agency Standing Committee (IASC) and local activities.

1.6.3 Experiences on developing climate services in Norway (Inger Hanssen-Bauer)

Prof. Inger Hanssen-Bauer, Head of the Norwegian Centre for Climate Services (NCCS), presented the center's operations and lessons learned. The Norwegian Centre for Climate Services was established to provide decision makers with information relevant for climate adaptation - in a changing climate. Lessons learned so far include the understanding that different users need information in different formats, and services need to be tailored to meet these different needs in order to have an impact. Second, a sound and broad scientific basis is necessary, and a common basis is helpful (such as the "Climate in Norway 2100" – report). Third, although communication between different sectors and groups may sometimes be challenging and/or time consuming, close contact with practitioners and users of information is essential when the aim is to produce knowledge relevant for societies in urgent need of strengthened climate resilience.

1.6.4 Good practices from Iceland in risk assessment and adaptation to climate change (Sigrún Karlsdóttir)

Dr. Sigrún Karlsdóttir, Director of Natural Hazards at the Icelandic Meteorological Office, presented experiences from Iceland on risk assessment of natural hazards, and adaptation to climate change, with a focus on the energy sector. Karlsdóttir highlighted the importance to involve local municipalities to get local ownership and feedback and establish trust and common understanding between institutions and scientists. In the energy sector, the national hydro-company has integrated scientific findings on climate change into investment planning and decision making in order to climate screen and strengthen the resilience of the energy sector. Information has also been made available for the public on how to e.g. utilize wind energy in a changing climate. Based on lessons learned from other Nordic countries, there has also been identified a need to create a center of excellence for climate change in Iceland.

1.6.5 Panel discussion on risk assessment and analysis

The panel discussion focused on dealing with uncertainties and future risks, learning from past emergencies, and adopting new technologies, as well as risks related to the resilience of

infrastructure. The need to emphasize both local but also governmental agency was voiced, as well as the need for multidisciplinary cooperation, open data sharing and common visions.

1.7 Building Resilience and Adaptation Capacity (Session 2)

1.7.1 Operationalizing social-ecological resilience (Martin Sommerkorn)

Dr. Martin Sommerkorn, Head of Conservation at WWF Arctic, Norway, gave a keynote on the current state and actions needed for building resilience and adaptation capacity. The resilience approach is about bridging the gap between society and environment, with a focus on human agency. There is an increased interest in standardized tools for assessment and analysis, but a too narrow set of tools may block the deeper understanding of systems, where e.g. risks are always interrelated with rights and societal developments. There are different strategies to strengthen resilience, which could be grouped along the axes of system structures - system dynamics, and system analysis – management and governance. Capacities to engage with include natural, human, social, and cultural capital, as well as institutions, infrastructures, financial capital and knowledge.

Sommerkorn highlighted this point through examples: co-production of knowledge and learning includes the desire to work with the best knowledge base, but also challenges related to e.g. the power of knowledge, as experienced in the co-management systems in Canada.

Regarding local participation in observation of change, there are promising emerging network initiatives, namely the Circumpolar Local Environmental Observer Network (CLEO) and the Circum-Arctic Coastal Communities Knowledge Network (CACCON). Both highlight that participation is needed, but participation is more than observation.

Regarding tools for assessing ecosystem management strategies, there are numerous ongoing processes for making ecosystem-based management fit for responding to scenarios of climate change, and stakeholder discussions where research needs, and societal needs are united and discussed. Another area of challenge is stewardship of local ecosystems.

The relation between conservation, preservation and resilience is also an intriguing question. By fostering adaptation, resilience and development operations, we can steer towards alternative futures, but not knowing the future calls for keeping all services available, and hence safeguarding the widest possible sets of biodiversity today – as well as in the future.

Sommerkorn pointed out that currently we are not far with utilizing ecosystem services for strengthening resilience and adaptation in the Arctic. Dedicated Arctic multi-stakeholder processes, indicators monitoring the full range of resilience status, as well as investment schemes for supporting resilience action are non-existent. Millions of dollars are invested in the Arctic, but commercial tools are not tailored and screened for ecosystem sustainability, as they only measure direct monetized values. Finally, a concern that has been voiced by both CAFF and

PAME, is that we are monitoring a system we do not know, because we monitor species, but not ecosystems as such.

1.7.2 Participatory dialogue processes in land use (Pentti Hyttinen)

Dr. Pentti Hyttinen, Director General of the Finnish state-owned forest enterprise Metsähallitus, presented how stakeholders are involved in decision making concerning land use in Northern Finland and Finnish Sápmi. Metsähallitus is responsible for managing, using and protecting all state-owned land in Finland and Lapland, and more than 90% of the land in many municipalities is actually state-owned. The main tool in reaching agreement between different interests of stakeholders is the annual natural resource planning, which is a bottom- up planning process focused on stakeholder interaction, seeking to recognize the needs for different land use and natural resources of livelihoods and local communities, and with the aim of increasing, not stripping, the future potential. Different stakeholders are involved in the planning work e.g. through workshops, site visits, questionnaires, different kinds of tools, incl. even virtual 3d models. Local communities are encouraged to participate in finding common solutions.

As an example, enabling reindeer herders to secure conditions for their livelihood is extremely important, and there is a specific agreement that secures the interest of reindeer herders in land planning, leading to more reindeer-friendly forestry. Hyttinen highlighted Akwé: Kon guidelines that are used in stakeholder dialogue with Sámi communities and negotiations with the Sámi Parliament, as well as methodologies of inclusive planning with local communities and with environmental organizations, which are used e.g. when developing tourism centers. The experience shows that through interaction and communication the risks of conflict and misunderstanding can be considerably reduced.

1.7.3 Local Arctic Environmental Observations (Mika Aromäki)

Mika Aromäki, Coordinator at the Sámi Education Institute in Inari, Finland, presented the "Local observations from the environment in the Arctic" – project, which is a part of the international CLEO network, and coordinated by the Sámi Education Centre with participation of the Finnish Environment Institute and the Ministry of the Environment, and supported by the Ministry of Foreign Affairs and the Sámi Parliament.

The aim is to engage local communities when gathering environmental data into a global network. In Finland, the participants in the project are the students of the Sámi Education Institute, which are mainly Finnish and Sámi herders, and the project is piloting environmental monitoring of water. Snow structure is another focus in the project, as it is affecting e.g. the migration in reindeer herding.

As one case, a smartphone interface has been established that enables local students to measure and report on the state of palsa (permafrost mounds found in Finnish Lapland). Palsas were used as landmarks when moving with the reindeer but are now increasingly disappearing.

1.7.4 Mental health and suicide prevention (Joanna MacDonald)

Joanna MacDonald, Climate Change and Health Officer at the Inuit Circumpolar Council (ICC), presented mental health work that the ICC is doing under the Arctic Council. For over a decade, ICC has identified mental health issues and suicide prevention as a central part of their work.

Inuit suicide rates are well above average, and research has identified a connection between climate change, mental health, and hence resilience. Climate change and the change in lifestyle that it brings, impacts directly on physical health, physical injury and death, obesity, diabetes. Furthermore, changes in ice brings changes in place-related identities, which can lead to depression, sadness, a decreased sense of capabilities, or drug use. MacDonald pointed out that resilient communities are healthy communities, and adaptation to new situations is easier for mentally healthy people.

The current work is based on the Arctic Health Declaration signed 2011 in Nuuk, and on previous projects conducted under the Chairmanships of Canada and the U.S., and are now advanced and broadened under the Finish Chairmanship. A discussion paper, Advancing Indigenous Suicide Prevention in the Circumpolar Arctic, has been published on ICC Canada's web site). The work is based on a circumpolar network, promoting community engagement. knowledge translation, and capacity building through digital storytelling on mental health issues.

1.7.5 Panel discussion on building resilience and adaptation capacity

The panel discussion highlighted the importance of inclusiveness, stressing the importance of participation of Indigenous Peoples and Local Communities, as well as Non-Governmental and Civil Society Organisations in building resilience. It is also important to recognize the diversity of voices, noting that both local communities and CSO's have different views that need to be considered. Regarding observations, the distinction between local observations as such, and indigenous knowledge, was noted. Referring back to the presentations, the panelists highlighted that there exist a multitude of ways to engage and empower people in resilience building actions.

1.8 Implementing Measures that Build Resilience with Policy, Planning and Cooperation (Session 3)

1.8.1 Building a Resilient North: Policy, Planning, and Partnerships in Anchorage, Alaska (Mara Kimmel)

Dr. Mara Kimmel, Deputy Director of Strategy, Scholarship and Research leader of the at the Anchorage Museum and leader of the Anchorage Municipality's Wel-

coming and Resilience initiatives, gave a keynote highlighting the approach of the municipality of Anchorage in addressing resilience and inclusion in a comprehensive manner. Anchorage is a typical Northern urban center in change, facing multiple transformation challenges e.g. related to its economic development, social inclusion equities as well as a changing environment. The city is built on ancient Athabaskan land, and currently reliant on the oil and gas industry, but now exploring alternatives. "Brain waste" being also one of the challenges, Anchorage has to look into how to better integrate the capacities of both indigenous and immigrant communities.

A range of practical measure have been undertaken to systematically include especially immigrant communities. The Welcoming Anchorage Roadmap and the Resilient Anchorage Roadmap aim at building communities' capacity to thrive and survive chronic stress and foster an equitable, inclusive and diverse society. Sharing experiences and values of multiple stakeholders is an important part, as well as building sound economic well-being, including a vibrant renewable energy sector.

Kimmel stressed that the work cannot be done by the municipality alone. Four major resilience partners have been identified including: Different sectors of governance (tribes, municipalities etc.), knowledge holders (incl. scientists, Indigenous Peoples and local knowledge holders), business community, and design community (to envision what a welcoming and resilient Anchorage will look like). One of the biggest challenges is, together with scientists, to communicate what changes are expected in the community and identify and communicate the expected impacts of change. Another major challenge is the lack of resources. While the resilience framework is important, it is essential to find concrete resources to implement the identified actions. Finally, the challenge is to make the development relevant to the communities, to create our own fates and to re-envision the basic needs of a self-reliant North.

1.8.2 Building politics and action on indigenous knowledge (Pipaluk Lykke)

Pipaluk Lykke, Cultural innovator of the NEBULA company in Greenland and initiator of the Arctic Nomads project told the story of this project on dog sledging. Dog sledging has been an integral part of life in Greenland and an important part of a vibrant Inuit culture. The sledge dog is protected in Greenland and is a unique dog species stemming from a different ancient wolf ancestor than most other dog species.

Between 1955 – 2015, the number of registered sledge dogs in Greenland has fallen by more than a half to around 15 000 in 2015 and it is still decreasing. This is due to changes in culture and lifestyle (with people increasingly using snowmobiles) but also climate change creates a different conditions on the land that was once used for sledging. The economy of Greenland has also undergone huge change, and the need for sledging in hunting and fishing is declining. At the same time, life style diseases such as obesity and diabetes are rising, and people are becoming more immobile.

The Arctic Nomads project invited all circumpolar Inuit communities to Greenland to discuss issues related to the livelihood of dog sledging. The tourism industry and business development organizations, researchers, and local politicians were also invited to contribute.

The project produced jointly a booklet with 22 recommendations, and also led to concrete actions, such as a government-initiated vaccination and chipping program of dogs, as well as possible further actions in an upcoming government program. There is also an aspiration to get dog sledging onto the UN cultural heritage list.

1.8.3 Pros and cons of the resilience ~~building~~ concept - from an Indigenous Peoples' perspective (Tuomas Aslak Juuso)

Tuomas Aslak Juuso, second vice-president for the Sámi Parliament in Finland, provided some insight on the perception of resilience to representatives of Indigenous Peoples of the North.

Resilience carries both positive and negative connotations. On the positive side is the acknowledgment that development based on indigenous knowledge has enabled the Sámi people to still be strong today, despite many challenges. Resilience thinking allows to develop a better understanding of the needs of Sámi people. On the negative side is the question of who has the power to define 'good resilience' and the risk for conflict with the self-determination right of the Sámi.

For the Sámi, resilience is related to at least the following elements that can reduce the risks of negative impacts from climate change. These include strong livelihoods (allowing for resilient and self-sufficient societies); space (Indigenous Peoples' livelihoods are tightly linked to land and waters and space); and co-existence and cooperation with nation-states (learning from one another, while preserving the right to have aspirations for their own people). Climate change is affecting our societies right now. At the same time, decisions are made for Sámi that split the lands and spaces available for traditional livelihoods and these pose threats to the resilience of our societies.

On the other hand, there are possibilities. Finland is the only country that has implemented Akwe:Kon guidelines (also referred to in the presentation of Pentti Hyttinen) into national practice. This can be a potential tool for stronger participation of local communities and there are already promising results on involving local societies (Sidas) in the development of land management. This shows good potential for the future, but political will is needed. It is time to stop simply talking about resilience and put it into action.

1.8.4 Resilience through Education (Courtney Pegus)

Courtney Pegus, PhD student at the University of Alaska Fairbanks, presented findings of the University's Resilience Education Program.

Several steps need to be taken to improve resilience in communities, and community participation is crucial. Informed and educated inhabitants make resilience action more efficient. He noted that an identified challenge is that indigenous communities can be disenfranchised by

western science, which can be perceived as linear and disembodied, in comparison to indigenous knowledge.

He presented work conducted for several years at the University of Alaska Fairbanks, on educational programs, where western disciplines are put into indigenous contexts, reducing the alienation of indigenous students.

One of the important methods has been to include elders and community members in the educational and scientific action and "wrap science" into concepts that are more familiar and accessible to indigenous students. One example is to put the entire learning experience in a format where traditional knowledge would typically be passed, mixing indigenous stories, place-based learning as well as physical experiences with fundamental concepts of western science.

1.8.5 *Panel discussion on implementing measures that build resilience with policy, planning and cooperation*

The discussion highlighted the importance of actively including elders and youth in resilience building activities, as was the case both in the Arctic Nomad project and in the Alaskan education program.

The role of educational programs in enabling and building resilience was discussed. It was noted that while some educational programs include elements of indigenous knowledge, they are often offered by Western-type educational institutions and evaluation is made according to Western scientific standards. The notion that Western science is culturally neutral was also questioned.

It was noted that the Arctic Nomads project resembles actions in Alaska, where Athabaskan elders have brought back dog mushing into the societies, resulting in strengthened structure in the life of the youth and cultural generation transfer. It was noted that similar concepts of using cultural symbols to raise the quality of life of peoples and communities could be broader used also for strengthening resilience.

It was concluded that getting more of these different initiatives together and "joining forces" could bring new opportunities. It was also noted that for now, almost no cities in the Arctic (apart from Montreal) are part of the Rockefeller 100 resilient cities.

1.9 *Encouraging Investment to Reduce Risk and Build Resilience (Session 4)*

1.9.1 *Resilient, climate smart investments in the Arctic (Husamuddin Ahmadzai)*

Dr. Husamuddin Ahmadzai, Special Adviser to the Nordic Environment Finance Corporation (NEFCO), gave a keynote on climate smart investments building resilience in the Arctic. While NEFCO is the world's smallest international financial institution (IFI),

owned by the five Nordic countries, it has recently received a mandate to finance smaller projects on climate change globally, together with Nordic enterprises. Among innovative financial solutions, NEFCO is one of the most advanced in microfinance and small-scale financing.

Ahmadzai highlighted food (and food security), water, and energy, as areas in need of climate smart and resilient investments in the Arctic. In the Arctic, attention is required to ensure good governance as well as flexibility in realizing climate related investments. While the focus of the Forum was on resilience building, Ahmadzai stressed the importance of urgently and simultaneously ensuring that global emissions reductions are achieved, to provide a chance for resilience building investments in the Arctic to be effective.

Ahmadzai also highlighted the possibility to learn from experiences from other environmental and sustainability driven investments in the Arctic that have among other things addressed contaminated hot spots in the Arctic. There is already a lot of identified challenges and initiatives covering e.g. the heavy industries, oil and gas, the large marine ecosystems, mercury, and black carbon in the region. Some good practices have already been gained worldwide in e.g. achieving the reduction of ozone.

NEFCO contributes to Arctic and global development mainly through a large portfolio of instruments for small scale interventions, including the Barents hot spot facility, project support instruments of the Arctic Council, and different public-private instruments. While especially private investments are needed for securing a sound enough base for long-term development, the role of NEFCO (and other IFI's) is to bring risk reduction and guarantees to the client. When looking for financing sources for Arctic resilience building it is crucial to ensure that strict sustainability criteria are respected, and that projects properly address grievance, monitoring and reporting requirements, and include a credible exit strategy.

1.9.2 EU action on climate adaptation (Max Linsen)

Max Linsen, Policy Officer at the European Commission, DG Climate Action, presented current EU developments and instruments relevant for Arctic resilience (on behalf of Elena Višnar Malinovská, Head of the Adaptation Unit).

Linsen stressed the need for actions both within and outside the Arctic due to the crucial role of the Arctic in global changes, and the high cost that climate change entails for Arctic ecosystems and infrastructures.

The EU adaptation strategy 2013 is based on a multilevel governance approach of what is needed to reach a more climate adaptive Europe and includes both a general and a local level, as well as a third pillar focused on knowledge and dissemination of knowledge. A recent evaluation shows that the strategy addresses real needs but recommends further alignment with recent international agreements, implementation of national and sub-national strategies and involvement of business and insurers to raise investments. One of the main challenges remains bridging the gap between high level policies and grass-root projects and to build measures for funding on different levels.

The need for regional cooperation is further emphasized by the fact that the most climate-vulnerable sectors are agriculture and forestry. EU supports regional cooperation by funding cooperation mechanisms ("soft measures") within four macro-regional strategies, but none of these is focused on the Arctic region.

The EU Covenant of Mayors for Climate & Energy covers a large share of European territory and more than 7700 cities, of which around 1000 are implementing adaptation plans. However, cities and communities in the Arctic region have not joined the Covenant to the same extent as the rest of the region, and reasons for this should be further explored.

Climate action is successfully being mainstreamed in EU funding and around 500 projects under the structural investment funds will be screened according to specific guidelines. The budget focus on climate related action, including development cooperation in the EU budget 2014-2020 is at least 20% (€180 billion), and will in the next funding period rise to 25%. In the future EU budget, climate considerations will be integrated into all main spending areas and climate proofing in terms of resilience will be applied to all projects with the time span of min. 5 years. For example, the LIFE program, which targets e.g. urban climate action and vulnerable sectors such as agriculture, forestry, and tourism, will grow significantly. LIFE provides funding for pilot, demonstration, best practice and governance projects, as well as integrated projects implementing climate plans and strategies at large geographic scale.

The EU Action Plan on financing sustainable growth, adopted in January 2018, contains 10 actions on climate mitigation and adaptation, and the first results are expected already in 2019.

1.9.3 Developing a sustainable tourism sector in a changing Arctic (Rauno Posio)

Rauno Posio, project leader of Visit Arctic Europe, a joint marketing and development project for Northern Scandinavian region travel companies, talked about how the tourism sector in Arctic Europe is adapting. The interest in Lapland as a travel destiny with its pure air and nature is growing, at the same time as the snowy season is dramatically shortening.

At the same time that global warming needs to be combated, the small tourism industry in Lapland must adapt. Tourism companies in the area are small, often micro-companies. These companies struggle with developing year-round livelihoods and seldom have resources for product development or market influence on their own. The Visit Arctic Europe project, first established in 2015, has shown that cross-border cooperation in the North can be very powerful. The project has so far involved 90 companies from Northern and Sápmi areas in Finland, Sweden and Norway. The project has been funded by Interreg North and is now entering its second phase, where all year-round business and employment will be in the focus of sustainable Arctic tourism development.

1.9.4 On mobilizing the wide spectra of investment (Joel Clement)

Joel Clement, Senior Fellow at Harvard Kennedy School, co-chair of the Arctic Resilience Report (2016) and one of the key persons in establishing the ARAF (2017), raised the importance of mobilizing the whole spectra of financial possibilities for Arctic resilience. The resilience framework expresses the needs for financing, and there needs to be a plan for directing funds strategically and accelerating the mobilization of funds for arctic resilience. Apart from public and private funding, also philanthropic investments are important to keep in mind when building a plan for how to mobilize investment across private and public boundaries and geographical borders.

1.9.5 Panel discussion on encouraging investment to reduce risk and build resilience

The panel discussion focused on the challenges both of identifying and defining "bankable resilience projects and initiatives" as well as communicating these investment needs from a climate resilience building perspective, with multiple development benefits. While the urgent need to catalyze finance for reducing global greenhouse gas emissions was recognized, the need of investments in strengthening resilience in Arctic can help prevent climate risks from becoming reality, while at the same time help create new livelihoods that are more climate compatible. Sustainability in investment was discussed. A question was raised on the role of the Arctic Investment Protocol, launched by the World Economic Forum in 2015 and governed by the Arctic Economic Council, as a tool for resilience. The discussion noted that existing tools for addressing ecological impacts need to be used, but also social issues as well as the traditional knowledge of indigenous communities need to be integrated into investment prioritization, formulation and implementation. The availability of financial resources was identified as a key challenge and there is a need to further explore multiple and innovative sources for financing resilience action. Of crucial importance is also how the benefits of investments are shared with local communities. There exist good practices from different sectors and different regions that can serve arctic regions as well. Despite particular characteristics of the Arctic there is no need or time to reinvent the wheel. As a concrete example, the tourism sector was highlighted, as a sector that can increase the economic sustainability of local communities, at the same time as the importance of sustainability in tourism is becoming increasingly important also for the consumers.

1.10 Where do we stand and ways forward (closing session)

Day 1 was concluded with a closing session, inviting Forum participants to reflect openly about their initial conclusions and key takeaways.

Marcus Carson, Senior Research Fellow, Stockholm Environment Institute, stressed the importance of linking people and nature, with an emphasis on human agency and on our capacity to gain insight, make decisions and act on these. A key challenge is to bridge the silos between knowledge systems (human and natural sciences, sciences and indigenous knowledge, expertise in policy, implementation and practice) and to secure the resources to tackle challenges from many different angles. There is also an urgent need to move from insight to action, to achieve changes in patterns of behavior and to translate high level policies into practical local action. For communities, the most important contributor is the ability to self-organize, and that capacity requires practice.

René Söderman, Senior Arctic Official, Ministry for Foreign Affairs of Finland, stressed the concept of resilience as a way to organize our mind and explain what needs to be done. Quoting President Tarja Halonen at the recent UArctic Congress, "climate change is not a project". The Arctic Council aims to promote sustainable development with a focus on climate work. This is our responsibility towards the future generation, and in this work, we need to respect all stakeholders and have the dignity to do the right things.

Ambassador Björn Lyrvall, Senior Arctic Official, Ministry for Foreign Affairs of Sweden, concluded that the day had shown the importance of the resilience perspective. This kind of Forum was exactly what was envisioned a few years ago, when Sweden and the U.S. engaged in this project. The idea was to launch an interdisciplinary project to investigate Arctic response to shocks in ecosystems and to look into the factors that influence the possibilities of the populations and communities to effectively respond to these shocks. Now we are about to achieve some of the main aims of the project. We have a deeper understanding of socio-ecological tipping points and of the importance of resilience in the work of the Arctic Council and its working groups. Now the priority is to develop ways to convert these insights into action.

Reid Creedon, U.S. Head of Delegation to the Sustainable Development Working Group, returned to the question posed earlier during the day by Tuomas Aslak Juuso (session 3) on "who defines resilience". Resilience is successful response to change, so the question is really who defines success. We need collaboration between and across the Arctic Council players and other stakeholders, and we need to keep going and continue to develop the network of people who define resilience.

Ethel Blake, Chair and Head of Delegation for Gwich'in Council International (GCI) emphasized the resilience of Arctic Indigenous Peoples, referring to the case of the oil field in the Arctic National Wildlife Refuge (ANWR). The Arctic Council has for a long time stressed the importance of having representatives of Indigenous Peoples at the table and taking indigenous knowledge into account. She noted that indigenous knowledge is the knowledge coming from our land that has been passed from one generation to another and giving the ability to continue to adapt to changes. However, today's changes are changing the very core possibilities for indigenous knowledge. The Arctic Council is encouraged to continue the work with Indigenous Peoples at the table to determine how resilience thinking and indigenous knowledge will be incorporated into science.

Teppo Säkkinen, Special Adviser to the Minister of Agriculture and Forestry in Finland Jari Leppä, concluded the day by reminding that agriculture and forestry are examples of livelihoods that are extremely vulnerable to climate change, and that change comes with a price tag, referring to special subsidy packages for agriculture, needed this year among other in Finland due to an exceptionally hot and dry summer. Adaptation and mitigation to climate change also comes with a price tag, and although resilience is much about local communities, also nation states have the responsibility to improve resilience. Adaptation and resilience go well together, as Prof Sörlin pointed out, it is about bending without breaking. The connections between resilience and sustainability have also been pointed out, and resilient societies are in other words good, healthy, working societies. Overarching knowledge is an important theme, including both scientific and indigenous knowledge, and knowledge is needed also for the benefit of local communities, whether it is about calculating fishery quotas, or utilizing meteorological and climate data for the tourism sector. Also, it is important to remember that the Arctic is not an empty space, but the home of many different peoples and their livelihoods. Säkkinen concluded the day with a few words about the sustainable venue of the Forum, the Science Centre Pilke, and thanked all the participants for a fruitful and educational day.

Resilience in the work of the Arctic Council – Day 2 summary

During the second day of the Forum participants continued to share experiences and lessons learned for operationalizing climate resilience in the Arctic. The approaches and experiences of the Arctic Council Working Groups were highlighted and ways forward identified through interactive workshop sessions and plenaries.

The overall aims of Day 2 were to i) share experiences and lessons learned for operationalizing climate resilience in the Arctic, and to ii) identify ways to harness synergies, enhance collaboration and help accelerate concrete action for climate resilience in a region highly impacted by climate change.

The day included both plenary sessions and parallel sessions in breakout groups, facilitated by selected ARAF Implementation Team representatives and Gaia Consulting. Hereby the second day aimed to help operationalize and mainstream climate resilience more broadly – in the work of Arctic Council and its Working Groups, but also by all other Arctic stakeholders, noting that “all hands on deck are needed”.

1.11 Plenary Session: Presentation of good practices by Arctic Council Working Groups

René Söderman, Senior Arctic Official, Ministry for Foreign Affairs of Finland, introduced the day by referring back to the warning signs of climate change that speakers during day 1 had voiced, and the importance of forming a better understanding of the opportunities and of learning from concrete good practices. Resilience can help us to see the bigger picture of climate change, where changes and impacts are interconnected, and especially to recognize the concrete impacts climate change has on communities. The Arctic Council Working Groups are all involved in resilience building actions. The aims of the first session are to describe climate risks of key concern, and in particular learn how Arctic climate resilience is currently being strengthened through the work of the Arctic Council Working Groups.

1.11.1 Arctic Contaminants Action Program, ACAP (Ulrik Westman)

Ulrik Westman, Chair of the Arctic Contaminants Action Program (ACAP), presented the Working Group's action-oriented projects on how to combat pollution in the Arctic environment. He emphasized that resilience is about being prepared to take action and that projects within ACAP focus on being prepared and able to adapt to extensive and costly change, avoiding difficult consequences.

Among ACAP resilience projects *CLEO – the circumpolar local observation network* was noted, making observations web-accessible, including a mobile app launched in February 2016, which has developed into a powerful tool in the field, providing robust field reporting capabilities even in the most remote areas. The tool has spread from Canada to the entire Pacific coast of North America, and it is being established in the Nordic countries, and there are plans towards Russian indigenous communities. The purpose is to help improve preparedness by enabling early documentation of contaminants in the environment, and encourage actions to reduce emission and releases of other pollutants in the environment

The *Arctic Black Carbon Case Studies Platform*, done together with the EPPR Working Group, provides a «one stop shop» for best practices and lessons learned from black carbon demonstration projects from across the Arctic region. More case studies are welcome from all Arctic States, Permanent Participants and Observers. The *Community Based Black Carbon and Public Health Assessment*, which recently started, will assess, on a pilot basis, local sources of black carbon emissions from a representative sampling of Arctic Alaskan and Russian villages. A framework is being drafted on the community-based assessment of black carbon and education of local communities about black carbon emissions and risks.

The Mitigation of Black Carbon and Methane from APG Flaring in the Arctic Zone of the Russian Federation is another project seeking to improve the knowledge on black carbon and methane emissions in the Russian Arctic, with emphasis on the oil and gas sector, and spur enhanced actions to reduce APG flaring.

1.11.2Emergency Prevention, Preparedness and Response, EPPR (Jens Peter Holst-Andersen)

Jens Peter Holst-Andersen, Chair of the Working Group on Emergency Prevention, Preparedness and Response (EPPR), emphasized that EPPR work is all about resilience. To illustrate the impacts of incidents, he showed a video of a landslide leading to a tsunami in Greenland a year ago, having dramatic effects on a small community.

The project on *Prevention, preparedness and response in small communities* is related to resilience and oil spill and aims at building awareness of what incidents may create in small villages. In the second phase, short awareness videos are being produced. Challenges include ensuring the engagement of local communities and developing tailored digital outreach material. Feedback to this first attempt will be used to adapt the materials to ensure they are being used. Active engagement of the Permanent Participants of the Arctic Council would be welcome, as well as input from Observers and relevant stakeholders. As noted above, in order to engage local communities, sufficient time and resources are needed in the design phase, allowing e.g. for translation of questionnaires and baseline studies for local communities, also facilitating the tailoring of deliverables, outreach materials, including digital materials (when/where access to internet is available).

Another project contributing to resilience building presented by Holst-Andersen was the *Risk assessment methods and metadata* project, where a guideline document and practical tool box towards creating best practice in circumpolar marine environmental risk assessment is being created. The project needs involvement of Arctic States, Permanent Participants, Working Groups, Observers and other relevant stakeholders, with a series of webinars underway. Interested contributors can contact the secretariat.

A third project presented was the implementation of *the Framework Plan for Cooperation on Prevention of Oil Pollution from Petroleum and Maritime Activities in the Marine Areas of the Arctic*. The framework plan covers multiple objectives with direct relevance for resilience, and EPPR and (co-lead) the Working Group on Protection of the Arctic Marine Environment (PAME) are in the process of collecting suggestions from the other Working Groups. It was noted as an example of cross-group collaboration, which is of increasing importance in the future, in operationalizing and accelerating effective action on resilience.

1.11.3Arctic Monitoring and Assessment Program, AMAP (Tove Lundeberg)

Tove Lundeberg, vice chair of the Arctic Monitoring and Assessment Program (AMAP), emphasized that AMAP aims at building a common understanding of the challenges related to climate change in the Arctic, and thus builds the knowledge base needed for resilience action, and combining science and indigenous and local communities' knowledge. AMAP assesses the status and trends for climate change and pollution in the Arctic, as well as the effects of these changes on the ecosystems and humans - and proposes actions for national and international processes and policy development.

The Snow, Water, Ice and Permafrost in the Arctic (SWIPA) assessment explores changes in the cryosphere, such as temperature loss, sea level, etc. The report shows that the Arctic today differs a lot from the Arctic a few decades ago, and will continue to change, even if we succeed with climate change mitigation. The recommendations stress the urgent need for adaptation, filling knowledge gaps and advancing the understanding of the changes, as well as raising public awareness. AMAP continues to work with the outreach of the project, as the report can be used as a foundation and contribution for other studies.

The Adaptation Actions for a Changing Arctic (AACA) project consists of three regional reports on adaptation, exploring how the physical changes together with the socio-economic changes impact on ecosystems and humans. The work shows the urgent need for adaptation efforts and the need for protecting and strengthening resilience across socio-ecological systems. Lundeberg highlighted that the regional report on the Barents region includes a chapter on resilience, pointing out five qualities with indicators for resilience that makes it easier to follow up performance.

The long list of planned AMAP activities include several new projects on pollution issues, climate work, meteorological cooperation, cooperation with the Working Group on Protection of the Arctic Marine Environment (PAME) on marine litter and cooperation with the Working Group on Conservation of Arctic Flora and Fauna (CAFF) on biodiversity assessment actions.

1.11.4 Protection of the Arctic Marine Environment, PAME (Jan Ekebom)

Jan Ekebom, Finland's representative in the Working Group on Protection of the Arctic Marine Environment (PAME), presented PAME's mandate to address policy measures related to the conservation and sustainable use of the Arctic marine and coastal environment in response to environmental change. The work of PAME includes development of best practices, guidelines, and recommendations as well as other policy-related work.

The work plan 2017-19 contains a considerable number of projects, of which many are carried out in cooperation with other Working Groups and address resilience building. Much of the work is conducted by PAME's six Expert Groups.

The Area-based Management Marine Protected Area (MPA) Framework and the *MPA Network Toolbox*, a collaboration with the Working Group on Conservation of Arctic Flora and Fauna (CAFF), is developing pan-arctic MPA networks, building on national efforts. The Toolbox informs decision-makers, practitioners, Indigenous peoples, and stakeholders involved in developing MPA networks and ecosystem-based management in the marine Arctic e.g. through a series of workshops.

The PAME Ecosystem Approach group prepares guidelines on ecosystem approach management through continuous reporting, a series of workshops and a conference. Other examples presented include the desktop study on *Marine Litter and Microplastics in the Arctic,* cooperation projects between PAME and other Working Groups on marine litter, and the cooperation with CAFF on invasive alien species.

The MEMA II project - *Meaningful Engagement of Indigenous Peoples and Local Communities in Marine Activities* - has summarized some good practices for meaningful engagement, including identifying issues requiring engagement, developing engagement plans, considering cultural differences and differences in communication, building trust and respect, fostering transparency, and reporting back to the community.

1.11.5Conservation of Arctic Flora and Fauna, CAFF (Marcus Carson)

Due to a coinciding meeting, the Working Group on Conservation of Arctic Flora and Fauna, (CAFF) was not present at the Forum, but supported Marcus Carson, **Senior Research Fellow, Stockholm Environment Institute,** in presenting the *Resilience & Management of Arctic Wetlands initiative*, which was initiated by Sweden during the US chairmanship and is organized within CAFF.

The project aims at enhancing engagement with the roles and functions of Arctic wetlands as a resource to support sustainable development and resilience in the Arctic. Wetlands constitute a large part of the Arctic and their role for sustainable development is critical, as they are directly related to climate change and adaptation, biodiversity, ecosystem services, and the livelihoods of indigenous and local peoples. The effects of climate change on Arctic wetlands, their biodiversity and functioning are still little understood but can be expected to be considerable.

The initial, scoping phase of the project has focused on analyzing wetland inventories, conducting a scoping study of relevant scientific literature and indigenous and local knowledge, and identifying key knowledge gaps and research needs. The review of scientific literature on wetlands identified research from an almost exclusively natural science perspectiveLiterature on regulation and management of wetlands in Arctic regions did not show up in the review, yet we know there is a considerable body of research on the Ramsar Convention, the EU Water Framework Directive, the Clean Water Act (U.S.) and other efforts to regulate and manage human activities that impact wetlands areas. However, while this literature is relevant to the project, it is unclear how much of it speaks directly to Arctic wetlands. The task for the second phase of the project will be to ensure systematic examination of linkages between the social and the ecological side, to make the inventories comparable and to ensure that the literature review encompasses regulation, and sustainable management and use of research relevant to Arctic wetlands. Carson highlighted the project as an example of resilience building that often requires bridging of expertise and engaging broad stakeholder action, as he noted the need for a reference group with broad expertise, a need to link not only natural and social sciences, but also to bring in people with policy and management expertise. In conclusion he stressed the need for systematic connection to the policy and implementation side and to recognise and engage with indigenous and local knowledge.

1.11.6 Sustainable Development Working Group, SDWG (Pekka Shemeikka)

Pekka Shemeikka, Chair of the Sustainable Development Working Group SDWG, highlighted the human dimension and why resilience is relevant to all SDWG initiatives. The strategic framework of the SDWG includes twelve priorities to help human development, and projects are clustered along these.

One of the priorities is the development of sustainable economic activities and increasing community prosperity, including environmentally-friendly economic activity in the energy sector. SDWG work includes an energy toolkit for local communities, work with remote energy networks to move from diesel to renewable sources, a series of Arctic energy summits collecting best practices related to renewable energy and assessing the use of heavy fuel oil in indigenous communities.

Arctic human health issues and the well-being of people living in the Arctic is another of the main priorities. Work includes an expert group under SDWG, the *OneHealth project*, initiatives related to food production and food security with emphasis on indigenous knowledge and the Arctic as a food producing region. *The Zero Arctic* project will develop regional concepts for Arctic building construction that would be carbon neutral over their full life cycle. Hence these examples showcase the fact that many of the approximately 30 projects of SDWG have a strong resilience component, and many of them are climate related.

In addition to implementing its various projects, SDWG also seeks to develop more strategic guidelines, trying to build a bridge between environmental protection and economic development, to start a new discourse on sustainable economic development, defined as a low carbon, resource efficient circular economy in the Arctic. Within this context, one of the project groups under SDWG is looking at how to better mainstream and harness the potential of the SDGs in all Arctic cooperation.

1.11.7Discussion on the Working Group presentations

The discussion focused on how the ARAF framework can serve the resilience work of the Arctic Council and its Working Groups, and how climate resilience is currently integrated in Working Group projects. Also, the discussion touched upon how to balance ecological, natural science perspectives with human and socio-economic perspectives in advancing resilience in Arctic regions. While each working group approaches resilience questions a bit differently, they complement each other well and several possibilities for harnessing synergies further do exist.

Pekka Shemeikka concluded that the presentations from day 2 morning session confirm that there is already a lot of valuable resilience work going on. Referring to the meeting in Levi in March 2018 (see section 1.3.3), where the resilience Forum was first planned with the Working Groups, he expressed the hope that the day's discussions will help the Arctic Council accelerate action and jointly take steps forward.

1.12 Guidance and inspiration for day 2 breakout sessions and plenary

Before breaking out to group sessions (see Annex 1 for day 2 program), guidance and food for thought for the work in breakout groups was provided by two presentations with a view to highlight potential tools as well as approaches needed to concretely accelerate resilience building action.

1.12.1 Arctic Spatial Data Infrastructure (Arvo Kokkonen)

Arvo Kokkonen, Director General of National Land Survey of Finland and Chair of the Arctic Spatial Data Infrastructure (ASDI) Board, presented the ASDI project. The project was established to address the global problems related to spatial data. It is often difficult to access and combine spatial data, and there is a lack of standardized distribution of data. The vision is to facilitate access to geospatial information in support of social, economic, environmental monitoring, decision-making and other needs in the Arctic. Hence the project aims to promote cooperation and the development of a Spatial Data Infrastructure that enables discovery, visualization, access, integration and sharing of Arctic geospatial data. ASDI is a voluntary commitment of the national mapping services of eight Arctic countries. It is based on using existing data, not aiming to make new mappings.

ASDI services include a web portal that provides easy access to geospatial data viewing and discovery, a searchable metadata catalogue, authoritative reference data, and thematic data and partnerships with distributed sources.

The project cooperates with the Arctic Marine SDI Working Group to facilitate access to Arctic marine data and to integrate sea and land data. On initiative of the US Chairmanship of the Arctic Council, the work also includes partnering on a Pan-Arctic Digital Elevation Model (DEM). The project has also started to harmonize a base map using data from mapping agencies, with the aim of providing a unified topographic view over the entire Arctic. The ASDI Geoportal was built for browsing, visualizing, analyzing and sharing spatial information. It is a contribution to common data and can be used free of charge. The Geoportal features a time series tool that can be used to visualize phenomena over time, as well as dynamic interactive maps and location search.

In the future, spatial and statistical data will be combined across the Arctic region, enabling better analysis and better decision making. Improved access to data will help to better predict, understand and react to changes in the Arctic.

1.12.2 Building bridges to enable resilience action (Joel Clement)

Joel Clement, Senior Fellow, Harvard Kennedy School, began his intervention by reminding about the tipping points and thresholds, also highlighted in the Arctic Resilience Re-

port. In order to react to them, we need to know where they are. The changes are already leading to many local communities losing their land, and urgent reaction is needed. To illustrate the challenge, Clement made an experiment with glasses filled with liquid (referring to a "glass of suffering, that cannot be emptied") and the need for a strategic approach covering a mix of adaptation and mitigation measures.

In order to address the challenges, Working Groups, as well as other Arctic stakeholders and partners, will need resources and good examples of how the ARAF framework can be operationalized. The Framework can also be used to leverage visibility to the important work that the Arctic Council and its Working Groups are already doing. As the Arctic changes twice as fast as the rest of the world, it should be a prioritized target for international investment. Increased visibility of the Arctic Council work cannot but help leverage the needed funds.

1.13 Breakout Sessions and wrapping up in plenary

Following the morning session (3.1), and the guidance provided for breakout sessions (3.2) the participants were invited to freely choose their breakout groups, and hence work continued in six thematic groups, each led by a Working Groups representative and supported by a facilitator.

The main aims of each breakout session were to identify success criteria and enablers of climate resilience work (what has worked so far, what could have helped to better manage climate risks and/or build resilience proactively, with more severe climate risks in sight, will the same (good or best) approaches work). Cases presented during the first plenary session, as well as other work done by the Working Groups, were used as input for discussions, but also experiences of other breakout session participants were invited as input. After discussing in small groups, the breakout groups convened to share their insights and experiences in plenary.

1.11.2 Emergency Prevention, Preparedness and Response, EPPR

The group chaired by EPPR discussed key success criteria and enablers of climate resilience work, using the Small Community project and its lessons learned as a case. Good practices so far included plenty of dedicated people in the working group and a recognition that we are all doing our best - but also that there is room for improvement. Lessons learned included the challenges with reaching out to the communities in a way that found the "right people in the right language and the right communication format".

The discussion focused on how to work with other organizations and engage them as active participants in the project. There is a need to raise awareness of the States and the Permanent Participants about this work and its importance. It was noted that if we want the work to be important to small communities, the States and the Permanent Participants need to help EPPR to get the "buy in" of the communities. The importance of respecting the local communities and inviting them into the project and benefit from their competences would improve the projects in the future. Importantly, project design needs from the beginning to take into

consideration the possible uses and communication of the results. Training and capacity building for the communities is important. There were also a range of more practical suggestions to ensure that projects engage more effectively with local communities, covering among other language and communication formats as well as issues related to project time tables.

1.13.1 Arctic Monitoring and Assessment Program, AMAP

The group chaired by AMAP discussed the presentations of the morning session and wished to emphasize that flexibility, bottom up approaches and cooperation between all Working Groups is needed, because their mandates are complementary. Information sharing about climate change, and communication across scales is important. Local communities should drive research agendas and resilience work should rely on local agency, local needs and demands. Guidelines for achieving resilience should be context specific. There is also a need for awareness raising at the local level.

One interesting proposal was to link the Arctic Council's resilience work to the Sendai framework and use existing Sendai indicators to measure resilience. The road maps towards resilience (within the Sendai framework) could be a useful tool.

Further, the group discussed specific challenges with AMAP work, connected to the distribution of knowledge. The base for AMAP products is scientific knowledge, but there are challenges in reaching the people that should use this knowledge and in translating it into usable forms for different user groups. Participants also saw a need to help the users of knowledge fill gaps in assessments, by integrating indigenous and local knowledge into the assessments. Also, the interaction with national and EU funding should be improved as an opportunity for increased action.

1.13.2 Arctic Contaminants Action Program, ACAP

The group chaired by ACAP discussed among other things ACAP's complementary role with the Arctic Monitoring and Assessment Program (AMAP). ACAP takes the knowledge base created by AMAP and uses this to enable local action, building on recommendations from AMAP on a more concrete level, and supporting local action. While action takes place on local level, it is dependent on global conventions. The role of ACAP in building resilience locally is interrelated with development in global forces, and with sharing expertise and experience. The group noted that while AMAP has funding for studies, but not for implementation of action, and the Arctic Council Project Support Instrument, coordinated by NEFCO, had been established to deal with this, it is still hard to access funding for concrete local action. As ACAP has an important role in climate mitigation the group also discussed the need to find a balance between adaptation and mitigation measures, which may compete for the same resources. It was also discussed that the role of Observers has not been as strong in ACAP as it might be, which makes it challenging to bring in additional resources. The continuity of expertise is also a challenge, which threatens institutional knowledge, and makes the work of ACAP even more crucial. In addition, the gap between reports and policy development, and concrete action, was

discussed, and the need for the Arctic Council and ACAP to show leadership to drive concrete climate action.

1.13.3 Conservation of Arctic Flora and Fauna, CAFF

The group chaired by CAFF[5] discussed how to operationalize the idea of resilience and came up with a couple of different ideas.

It was suggested that each Working Group could report on the best resilience actions to the Senior Arctic Officials and have a dialogue with them on how to move forward on these. One suggestion was to start to work jointly with specific projects that are a good fit with resilience principles, and that have important synergy potentials, such as the wetlands project.

The group also discussed the possibilities for observers to participate in the Arctic Council work in general. It was also noted that while we often talk about observers as one entity, these involve both organizations and Observer States, international intergovernmental and inter-parliamentary organisations and international non-governmental organisations and they come with very different capacities. Observers could be better engaged in the work through bringing in needed expertise and also providing outsider perspectives.

1.13.4 Sustainable Development Working Group, SDWG

The group chaired by SDWG discussed resilient communities and the ARAF framework in the further work of SDWG. The relationship between resilience and sustainable development was discussed and one way of looking at it is that resilience brings dynamics and agency into the discussion. Mitigation and adaptation are both important aspects to work with climate change, and one should not be acted upon at the expense of the other.

There is particular benefit in looking at the interrelations between communities and environment through a resilience lens, and the Arctic Council should think more about how to organize itself within this work. There is a need to share best practices and to facilitate bottom up approaches, and a strong indigenous component is needed in these interactions. Sustainable economic development also needs to be considered, and the involvement of responsible private sector and businesses in this work. Research needs to be better communicated to the communities, and there is a need for education to ensure the well-being of the communities. SDWG has been involved in resilience relevant projects even before ARAF (e.g. the Human Development Report), and these can be used as good/best practices to guide and inspire further work. ARAF is strengthening this work by bringing new opportunities especially in two respects, by bringing forward and systematizing the knowledge of different risks, and by serving as a platform for sharing best practices for the benefit of practitioners and others.

[5] As for the morning session, while no CAFF representatives were present at the Forum, Marcus Carson stepped in to serve as ad-hoc chair for this breakout group (see also 3.1.5).

1.13.5 *Protection of the Arctic Marine Environment, PAME*

The group chaired by PAME discussed the importance of collaboration. To have success, one has to work with the beneficiaries and in a way that is sustainable beyond today. It is also elementary to become accountable for the impacts (or the lack of impacts) and how these relate to climate change and resilience.

To be sustainable beyond today one needs to know how climate change affects the world and there is especially a need for information that is usable for e.g. local communities' decision making. One also needs to bring in the right partners into the collaboration in order to succeed, as not all expertise, information or resources are in the hands of the Working Groups.

As a concrete example the group discussed cooperation with meteorological institutes, which is one priority area of PAME. It was discussed how meteorological data can best be used by local and indigenous communities. The knowledge needs to be presented not only in report, but it must work and serve on-the-ground work. One can e.g. use different radio alternatives or meetings between people to pass on the knowledge. In addition, other PAME projects, which hold potential interest for other Working Groups and could be expanded into broader Arctic Council projects were discussed – such as initiatives assessing the impact of climate change on marine areas, or projects investigating how to cope with marine pollution and litter.

1.14 *Final Panel discussion*

After the representatives of the Working Groups had summarized the key outcomes of the group discussions, an expert panel was convened with Co-leads of the ARAF-project **Marcus Carson** from Stockholm Environment Institute, **Sarah Abdelrahim** from US Department of the Interior, and **Saara Lilja-Rothsten** from Ministry of Agriculture and Forestry in Finland. The panel also included **Joel Clement** from Harvard Kennedy School and **Timo Koivurova**, Director of the Arctic Centre at the University of Lapland. The panel shared their insights and reactions to the results of discussions in breakout groups.

Joel Clement noted that one of the challenges coming up in the breakout sessions was that tipping points can really mean that e.g. the life span of one's culture is suddenly and abruptly interrupted, highlighting the need to act promptly. It was also noted that Permanent Participants in the Arctic Council framework are under resourced, and there should be more participation of the peoples from the land could bring significant benefits. Perhaps the biggest challenge with resourcing is that the valuable work of the Arctic Council is still not widely and internationally known ("actually in some ways, what happens in the Arctic has stayed in the Arctic").

Saara Lilja-Rothsten emphasized the rise of awareness as the key issue to strengthening climate resilience by mitigation and adaptation measures. It is essential that people understand what resilience means in verytangible ways. She emphasized that the side event organized by Metsähallitus in Pilke the same day was very valuable, because resilience needs the

voice and understanding of the youth also. The youth had been playing a resilience game, imagining their future accounting different factors such as income, social equity, and the local environment. She also brought a message to the Forum from the youth:

> *"Often, the future is pictured in a negative way. It was new to us to handle future challenges in a positive way. We learned that there are very big risks brought by climate change. We must find solutions. We must raise the level of awareness. We must get science, technology and practice to work hand in hand".*

Timo Koivurova gave a brief outline of the work with preparing the Forum and the Pre-Study done by the Arctic Centre which focused on Finnish good practices in climate resilience. He noted that the discussion during breakout sessions had centered much on human communities, and one suggestion coming up was that the Arctic Council could be a platform sharing resilience cases of relevance for all Working Groups. This could be done together with people at the local level, and also with private companies. He reiterated that one key challenge is that the Arctic Council work is still not well enough known.

Marcus Carson concluded that the engagement during the Forum has been remarkable and provides a lot more examples to plug into. One important take-home insight from the Forum could be the realization that it is not possible – and certainly not needed - to keep adaptation, mitigation and resilience apart. There are many sides to resilience and a key priority is not to pass key thresholds or tipping points, and hence find ways to avoid the shocks that come with such shifts. Facilitating engagement might not be the most visible work, but it is in practice central to building resilience, and it is vital to ensure that the required resources for building resilience are made available.

Sarah Abdelrahim emphasized that although the Arctic is not homogenous, there are still opportunities to learn from one another. The Working Group sessions provided concrete examples on how we can work with local communities. The ARAF is about highlighting some of the work already being carried out at different levels. The Arctic Council could make an important contribution by acting as convener of stakeholders at all different levels and by sharing information on how to build resilience on all different levels.

Saara Lilja-Rothsten reiterated that there is already a lot of work being done in the Working Groups. What we would need is to operationalize resilience into actions and pass the knowledge on to local communities. We need passion and ownership and an understanding that we all need to be part of the resilience work.

Joel Clement summarised the ARAF as a fantastic tool, but it is still just a paper that provides a structure. What we need are more examples of concrete work being done together. We need to further develop and operationalize the framework, in order to make it attractive for funders, to catalyze required funding for action and serve people concretely on the ground. There is much work ahead, but this Forum has been a wonderful start.

1.15 *Local and regional good practices in Finland*

While the Arctic Council Working Group representatives grouped for internal discussions on the next steps in implementing resilience action in their work, a public session was organized on good local and regional resilience practice in the Finnish Arctic and Sámi regions.

The aim of the session was to bring together diverse aspects of resilience and to discuss different approaches, ranging from researchers to local practitioners in Finland, in order to show examples/good practices and innovative measures to strengthen climate resilience in the Arctic. The session was hosted by the Ministry of Agriculture and Forestry and moderated by Saara Lilja-Rothsten.

Niina Hirvonen, Project manager at the Finnish Red Cross, presented the Arctic Disaster Management Study - And Finnish Red Cross role in response to major accidents. The purpose of the Study was to define the 'Arctic' from the Red Cross point of view, and to get a comprehensive picture of the Red Cross Movement's presence, services and capacity to respond in the Arctic, from small scale emergencies to major accidents and disasters. The Study found that there is strong local knowhow and capacity, with over 10 000 Red Cross volunteers all around the Arctic and good possibilities for cross-border cooperation. The harsh Arctic conditions, gaps in infrastructure, remoteness and long distances pose challenges to ensuring availability of equipment and efficient logistics in the Arctic. The material preparedness of the Red Cross in the area varies. In response, Icelandic Red Cross, Finnish Red Cross and American Red Cross in Alaska have e.g. developed trailer-based systems for relief and evacuation, as well as special arrangements and techniques, such as water-tight and air-droppable Arctic Emergency Survival Kits in Svalbard, Arctic First Aid developed by the Greenlandic Red Cross, and Canadian Red Cross discussions with Cree Nation about winterization of a field hospital. Six out of the eight Arctic National Societies maintain Emergency Response Units (ERUs) that are standardized Red Cross units of personnel and modules of equipment that are ready to be deployed at short notice as a part of IFRC's disaster response tools system.

Sirpa Kurppa, **Professor at the Natural Resources Institute in Finland (Luke),** shared the findings of a recently launched national report on the Arctic bioeconomy and resilience. According to the study, the building blocks of the Arctic bioeconomy include many things, characterized by originality and specialty. There is the richness of raw materials, land, forest and water resources and their sustainable use, combined with the good condition and cleanliness of the natural resources. There are also rather unique wild resources and their products and services, and the production environment, including soil, air and waterways, supports the use. Strengths are also the technical excellence in bioeconomy combined with co-operation between industries, and businesses adapted to the cultural environment and Arctic conditions. Recommendations for development measures for advancing the Arctic bioeconomy include ensuring sustainability, regeneration and circularity of Arctic resources. Arctic-focused and inclusive planning and joint management models should be used and a greater co-operation ensured between the bio and circular economy in the Arctic region. Good arctic communication and interaction is needed. The rate of processing should be raised by enabling

innovative financing tools to attract investors to Arctic products. The renewal of Arctic multilateral entrepreneurship should be supported by increasing marketing training, sustainability-based product development and business management. Arctic logistics, digitization and platforms should be developed.

Reijo Tolppi, Vice- Rector of the Lapland University of Applied Sciences, presented the Safety and Security Network in Lapland, which is a knowledge network to strengthen resilience and bring security aspects into the strategy of education. The operational model of the network has been appreciated as a best practice for regional network model (EPSA European Public Service Award 2012) and it builds on cooperation between safety & security authorities, public administration and municipalities, educational institutions, associations, non-governmental organizations, and businesses. Activities include regional activities, research, development and innovation, and education.

Marja Anttonen from the Reindeer Herders' Association gave a commentary with a presentation of the "Reindeer EIA guide", a guide to examiningenvironmental impact assessment (EIA) on reindeer husbandry in land use projects. By gathering the scattered knowledge into one place it is easier to take into account and understand the livelihoods needs in the planning processes.

The panel discussion focused on suggestions for the best measures to improve resilience in the Arctic, as well as lessons learnt to improve the sustainability and resilience in the Arctic. In the arctic circumstances the distances are longer, there are less people and they are more dependent on the communities, which are thus stronger. In the changing climate the vulnerability of e.g. tourism is rising, and this is one of the local concerns dealt with.

1.16 Concluding the 1st Arctic Resilience Forum

A final concluding Forum session took place after the parallel sessions of local and regional good practices in Finland as well as the internal session of the Working Groups. session.

Pekka Shemeikka, Chair of the Sustainable Development Working Group, reported back from the final session of the Working Groups. While no formal conclusions were reached, there was consensus that the Working Groups will need to continue the discussion and coordination on climate resilience action. The Forum was regarded as a highly useful platform showcasing the urgent need for taking joint action. He thanked the organizers for the Forum and the co-leads and all the people working dedicatedly on resilience and noted that the work will need to continue and accelerate.

Saara Lilja-Rothsten, Ministry of Agriculture and Forestry, the main organizer of the Arctic Resilience Forum, reviewed the process with creating the ARAF and highlighted the importance of not complicating things but instead working to embrace a pragmatic and straight forward approach. She also stressed the importance of agency and leadership. We have to work as fast as possible, operationalize data and research into practice, and finally we need passion and inspiration to be able to do what is required for building Arctic resilience at required speed and scale. Saara Lilja-Rothsten thanked all the participants for sharing their

knowledge, passion and inspiration during the two Forum days, and urged for continued engagement and cooperation.

Concluding remarks and ways forward

The 1st Arctic Resilience Forum, which was organized 10-11 September 2018 in Rovaniemi, Finland. lived up to expectations that it could help form a better understanding of the opportunities for cooperation connected to resilience in the Artic. While it served the participants to showcase and learn from concrete good practices as well as failures in the region it highlighted the urgent need for accelerated action to strengthen climate resilience.

The two-day Forum gathered nearly 100 Arctic experts, policymakers, and various key stakeholders, including representatives from the Arctic Council States, Working Groups, Permanent Participants, and Observers; national, regional and local government, academia, industry, non-governmental organizations; as well as a side-event targeted at children and youth.

The Arctic Resilience Action Framework (ARAF) provided a valuable structure for the discussions in looking for a shared understanding of how to operationalize resilience in an extremely vulnerable, rapidly changing as well as culturally, socio-economically and environmentally diversified region. It clearly can help to concretize the concept of climate resilience and serve to achieve what all Forum participants called for - to catalyze funding for action and serve people concretely on the ground.

The Forum highlighted the existence of a wealth of information, expertise and already existing experience in building climate resilience that can and should be actively shared and learnt from. The ARAF demonstrated its capacity to serve as a platform for sharing these experiences. While noting the leadership and mandates of the Arctic Council and its Working Groups, the Forum highlighted also the need to build partnerships across all relevant stakeholder groups in the Arctic – all hands on deck are needed.

The need for cooperation in environmental monitoring, sharing data, making climate information more user-friendly and in particular building bridges between scientific climate knowledge and indigenous knowledge were recurrent themes during the two-day Forum. The Forum provided many examples of how these needs can be addressed, and also helped to identify potential new partnerships for doing so.

The Forum also noted major challenges in sustainable and equitable management of natural resources. It is evident that climate change will increase pressures on

natural resources and strengthening resilience will require building capacities to deal with and reconcile these pressures. The Forum highlighted that local participation, transparency and respect are obligatory ingredients for reconciling conflicting interest in a sustainable manner.

The Forum noted the multiple climate risks faced in a wide range of Arctic livelihoods, including agriculture, forestry, fishery, food production, tourism, herding etc. and the need to strengthen the resilience of these livelihoods. In some cases, the disruption caused by climate change in the physical environment is already so dramatic and unavoidable that transformation of livelihoods remains the sole option. The Forum also highlighted critical aspects of human well-being and health as well as the importance of improving awareness and capacity, through examples related to health impacts caused by climate change and the need to transform education.

The Forum strongly identified a need to screen and climate-proof all investments in the Arctic, in order to reduce and manage risks caused by climate change. Strong voices were raised, however, to not treat climate change as a separate issue. It was recommended that addressing climate change must be dealt with as part of sustainable and inclusive development at local, national and regional Arctic level.

Finally, the Forum stressed the need for partnerships, and making use of experiences from other regions in accessing the required funding and other resources, noting the currently limited investments in building resilience in the Arctic.

The Forum participants expressed their appreciation for the event, and recommended follow-up for discussions conducted during the Forum and commitments made.

Annex 1 Programme of the Arctic Resilience Forum with links to presentations

To be included in the final version of the report

Annex2 Biographies of speakers

To be included in the final version of the report

Annex 3 Actions and projects suggested by the Arctic Council Working Groups

To be included in the final version of the report

Annex 4 Examples of building resilience in Arctic regions – case inventory of Arctic stakeholders

The following cases of Arctic resilience have been submitted by September 2018 by Arctic stakeholders[6]. The case inventory is continuously updated. All cases are available at the address: [LINK]

1. Canada: Crown Indigenous Relation and Northern Affairs (CIRNA)
2. Canada: Nunavut Housing Corporation - Geotechnical Site Investigations
3. Canada: Climate Change Geoscience Program: Beaufort Sea Coastal Zone Studies for Safe and Sustainable Community Development
4. Canada: Guide to Integrate Climate Change Measures into Municipal Planning and Decision-Making of Northern Communities
5. Finland: Inclusive planning and public participation aiming at resilience in the Arctic (Metsähallitus Forestry Ltd)
6. Finland: Climate resilient agriculture
7. Finland: Animal husbandry
8. Finland: Fish farming in the Arctic
9. Finland: Security of critical infrastructure services
10. Finland: Pedestrian Safety in Changing Climate
11. Finland: Maritime Safety/Maritime SAR, Safety, and Cooperation (OPV Turva)
12. Finland: Flood Protection
13. Finland: Safety promoting innovative technologies
14. Finland: Reindeer Herding (climate change forcing traditional livelihoods to adapt)
15. Finland: Empowerment of indigenous people

[6] The Finnish cases were collected as part of the Pre-Study for the Arctic Resilience Forum 2018. Koivurova, Timo; Kähkönen, Juho (2018).

16. Finland: Climate resilient tourism services in the Artic
17. Finland: Climate education and awareness with an Arctic touch
18. Finland: Access to financial instruments for building resilience
19. Greenland: Inuit Pinngortitarlu - Nuuk fjord monitoring and mapping project"
20. Iceland: The Nordic Welfare Watch - in Response to Crisis
21. Iceland: The Burfell Hydropower Capacity Expansion Project
22. Iceland: The Icelandic Electric Grid Emergency Management Forum NSR
23. Iceland: Risk Assessment of Natural Hazards in Iceland
24. Iceland: NORDRESS - Nordic Centre of Excellence on Resilience and Societal Security
25. USA: Traditional Ecological Knowledge Mapping of the Mulchatna Caribou Herd
26. USA: Training the Next Generation: Resilience Programs at the University of Alaska Fairbanks
27. USA: Anchorage: Welcoming and Resilient. Building Resilience in the American Urban Arctic
28. USA: The Interagency Arctic Research Policy Committee (IARPC) - A Model for Research Collaboration
29. USA: Cold Climate Housing Research Center (CCHRC) Sustainable Northern Communities: Housing Research for the Circumpolar Region
30. USA: The Alaska Coastal Community Protection Project
31. USA/Aleut International Association: Community-Based Ecological Monitoring through the BeringWatch Sentinel Program
32. USA/Aleut International Association: Enhancing Dialogue and Action on Coastal Resilience in Alaska
33. Arctic Athabaskan Council: Treaty and Aboriginal Rights Implementation in Denendeh (Northwest Territories): A paper for the Indigenous Nations Studies Journal
34. Arctic Athabaskan Council: United Nations Framework Convention on Climate Change
35. Arctic Athabaskan Council: Arctic Peoples, Culture, Resilience and Caribou
36. Arctic Athabaskan Council: A Guide to Community-based Monitoring for Northern Communities
37. Gwich'In Council International: Land Use Plans
38. Inuit Circumpolar Council: Development of a Circumpolar Inuit Wildlife Management Committee and Network

39. Inuit Circumpolar Council: Circumpolar Inuit Economic Summit and Development of an International Inuit Business Association
40. Inuit Circumpolar Council: Inuit Education Summit: Sharing Resources for Resilient Culture, Language, and Learning
41. Inuit Circumpolar Council: Pikialasorsuaq Commission: Supporting the Inuit-led Conservation of a Critical Marine Ecosystem
42. Inuit Circumpolar Council: Circumpolar Resilience, Engagement and Action through Story (CREATeS)
43. IASSA: Teriberka, Russia: Understanding Changes and Resilience in Coastal Social-Ecological Systems
44. IASSA: Implementing Arctic Resilience through Strengthening International Cooperation in Interdisciplinary Science, Traditional Knowledge and Education

Annex 5 ARAF Implementation Team

Gaia Group Oy
Bulevardi 6 A,
FI-00120
HELSINKI, Finland
Tel +358 9686 6620
Fax +358 9686 66210

ADDIS ABABA | BEIJING |
BUENOS AIRES | GOTHENBURG |
HELSINKI | SAN FRANCISCO |
TURKU | ZÜRICH

You will find the presentation of our staff, and their contact information, at www.gaia.fi