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COMPOSITE REPORT ON THE STATUS AND TRENDS REGARDING THE KNOWLEDGE, INNOVATIONS AND PRACTICES OF INDIGENOUS AND LOCAL COMMUNITIES

Regional report: Arctic

Note by the Executive Secretary

1. The Executive Secretary is circulating herewith, for the information of participants in the fourth meeting of the Ad Hoc Open-ended International Working Group on Article 8(j) and Related Provisions, the regional report for the Arctic on the status and trends regarding the knowledge, innovations and practices of indigenous and local communities, which has been used as input for the Executive Summary of the second phase of the composite report on the same subject (UNEP/CBD/WG8J/4/4).

2. The report is being circulated in the form and language in which it was received by the Secretariat.

* UNEP/CBD/WG8J/4/1.

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Biological Diversity in the Arctic
Final Report: September 2005

Composite report on status and trends regarding the knowledge, innovations and practices of Indigenous and local communities Region: Arctic

Consultant: Elina Helander-Renvall

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1. Introduction

The Arctic area is huge and there exists an enormous diversity of peoples, cultures, practices and conditions in this area. The task at hand is to investigate the status and trends regarding the retention of traditional biodiversity-related knowledge and how it relates to the Convention on Biological Diversity (CBD), article 8(j)-related knowledge. The terms of reference for this project point to many different issues and fields of reality. When talking about knowledge we have this question by Ole Henrik Magga (1996, p. 77) to ask: “Who owns the truth? Whose picture of the world is the right one?” Within the context of available resources, this report aims to concentrate on the issues that are of great importance for the Arctic Indigenous peoples themselves and which constitute factors that need attention in the context of implementation of the current biodiversity norms as expressed in the CBD. No single solution regarding biodiversity will be adequate (Gaston & Spicer 2004, p. 9). One challenge is that current research on biodiversity normally is based on quantitative parameters. The status of CBD 8(j) as related to

Indigenous peoples also requires qualitative studies. Such studies function as important indicators of the status of biodiversity-related knowledge and practices. One additional challenge to take into consideration is that biodiversity infrastructure (legislative measures, monitoring programs, financial support systems, capacity-building plans or other suitable indicators) to assess biodiversity and knowledge in the Indigenous communities is in many countries weakly developed. In addition, the knowledge and information-sharing regarding biodiversity is scattered and therefore difficult to access.

The Indigenous peoples view themselves as having a historical existence and identity that is separate and independent of the states now enveloping them (Morris 1993, p. 23). Lands located in a specific geographic area form a central element in their history and identity (Scheinin 2005, p. 4) and are central regarding their contemporary political demands. “Without the land and the knowledge that comes mainly from use of the land, we as Indigenous peoples cannot survive” (Baer 2002, p. 9). Indigenous identity is distinct and is produced and reproduced in concrete situations, through concrete activities and by enacting different discourses (political, environmental social, cultural, etc.). The approach in the Arctic must be integral and multi-dimensional where different approaches and discourses are used to work toward the common goals expressed in the articles of CBD. Many factors influencing sustainability and biological diversity are associated with regional and local conditions (see Posey 1999). Therefore, in this report, examples are given from different parts of the Arctic in order to give expression to the complexity of the biodiversity issue. It is not possible, however, to bring all specific cases from all local communities into light. Despite the diversity of the Arctic condition reflected in the research material of this report, one major aim of this report is to describe patterns and processes in a cohesive way while leaving doors open to myriad Arctic voices.

The Indigenous peoples consider themselves Indigenous to the areas or lands where they traditionally live or have lived. Indigenous peoples tend to perceive language, culture, nature, sustainability and biodiversity as related to each other in the sense that they constitute co-dependent determinants (Posey 1999). They know a lot about biodiversity because their lives and cultures are dependent on this knowledge (cr. Barsh & Henderson 2003). The Indigenous peoples are among those groups that are most affected by the efforts to protect their environment and measures that disturb their activities. However, their stakes and aspirations are not yet taken fully into account (Jentoft 2003, p.7). The Indigenous cultures have specific features and manifestations that enrich the cultural diversity of humanity. Therefore, it has to be emphasized here, that it “is increasingly evident that the ‘minority’ and disenfranchised peoples of the earth are the ones who speak for all humanity” (Posey 1999, p. 550). The Indigenous peoples are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems (UN ECOSOC 1986).

Ecology for the Indigenous peoples is a term that refers to a way of living in nature, and a way of living with nature and of nature (Utsi 1997, p. 23). “Tradition” is defined as consisting of those cultural elements that are handed down from one generation to another (Honko 1981; Svensson 1999). Traditions are dynamic in the sense that they are open to change and adaptation to new circumstances (Helander 1993). Traditional knowledge too is dynamic and changing (Helander 1993; Henriksen 2002, p. 176). The term “traditional ecological knowledge” (TEK) can mean many things depending on who defines the term (see for instance Berkes 1999; Burgess 1999; Helander 1992a; Sejersen 2004). According to Berkes et al. (1993, p. 2), it refers to “a cumulative body of knowledge and beliefs handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. TEK is an attribute of societies with historical continuity in resource use practices (ibid). TEK includes knowledge about environmental and subsistence practices; resource management systems; social organizations, institutions and rules; linguistic markers, terms and concepts; and values and worldviews (cr. Berkes 1999, Burgess 1999, Műller-Wille 1999, Posey 1999). “Different levels of TEK need to be considered together” (Berkes et al. 1993, p. 25).

The TEK is both quantitative and qualitative (Eythórsson 1998, p. 187). Epistemological thought is generated and normally learned through story telling, discussions, humour, meetings, gatherings, participatory activities, evaluation of previous activities (Helander 1992a, pp. 3-4) and by "listening and watching" (Andrew 2000, p. 126; see also Sejersen 2004, pp. 38-44). It is accumulated and refined through an accumulation of concrete, personal experiences (see, Voices from the Bay 1997; Jernsletten 1997, p. 87). The knowledge based on traditions is, or used to be oral and orally transmitted. Traditional ecological knowledge is usage-oriented and has practical relevance for the peoples concerned (Jernsletten 1997, p. 86). "Thus, what is 'traditional' about traditional knowledge is not its antiquity, but the way in which it is acquired and used" (Barsh 1999, p. 74). TEK is "the basis for local-level decision-making" in many areas of life, such as resource management, nutrition and food preparation (Posey 2000, p. 36). TEK also has gone through enormous politication (Sejersen 2004). One should pay attention to the collective or community knowing of a group of persons. One individual does not need to know everything because it is group knowledge that makes the difference (Freeman 1985, p. 275). For instance, in a Sami reindeer herding unit, 'báiki' (a family, a basic economic organization) and 'siida' (a group of related families and persons, several baiki-members) can be structured in such a way that they represent the maximal knowledge needed in that specific reindeer-herding unit (Betydning av produksjonsfaktorenes sammensetning 1990, p. 9).

An Innu from Labrador, Caroline Andrew (2000, p. 126) talks about traditional education in her childhood: "We learned by listening and watching, by practicing very carefully. We learned by playing and acting like real old Innu people. We behaved like real families and this was very helpful for learning the real things, because we were doing what we saw the Elders do." Now, she is worried about her own children and wonders: "Why can't I teach them in the way my parents taught me?" (ibid., p**.** 132). Indeed, one of the challenges facing the Indigenous knowledge emerges from this condition: how to maintain and transfer TEK to the future generations? How one learns is as important as what one learns (Simpson 2004, p. 27). Young people of today do not have concrete possibilities to take part in all seasonal subsistence activities. A Sami from Sweden, Olav J. Sikku (2000, p. 211) points out that parts of the traditional knowledge have faded since it is no longer needed among the younger generation and even if a younger member of the society should show interest in maintaining the traditional knowledge they might still lack the necessary practical ingredient. Another challenge is how to integrate TEK into the modern educational, scientific, administrative, juridical, political, and resource-management regimes and structures (see for instance, Sami Sustainable Development Program 1998 (Finland) and Arctic Indigenous Peoples and Traditional Way of Life (RAIPON 2002).

The eagerness of many groups to find solutions is tangible. It can be mentioned in this context that in Norway, the reindeer Sami women express the wish to have own education for reindeer herding managed by herders. This educational activity would use Elders and knowledge holders from reindeer herding society as teachers when transferring traditional knowledge to children and youth. Many parents think namely that the modern western-type education distances Sami young people from reindeer industry (Joks 2001).

Indigenous peoples are establishing new solutions in order to meet the challenges of modernity and overall change (Keskitalo 1994). These solutions, for instance regarding the use of local knowledge in the context of resource management, can differ from each other quite radically (Anderson & Nuttall 2004). However, the cultural and traditional knowledge-related base is still there. The cases from different parts of the Arctic show that it is important to explore and document traditional knowledge for the benefit of the modern society and its needs and challenges. It is also important that holders of different knowledge-traditions, Indigenous and non-Indigenous, come together and listen carefully to each others concepts and perspectives.

In this report, traditional ecological knowledge refers to the knowledge held by Indigenous (local) peoples about the ecological issues and phenomena in the sense discussed here. The biodiversity-related

knowledge is a matter of discourse and decisions made in different countries in relation to the Convention on Biological Diversity. In the Convention on Biological Diversity, article 8(j), Indigenous knowledge refers to knowledge, innovations and practices of Indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity. The Convention on Biological Diversity is ratified by over 180 states indicating that the values expressed in the texts of CBD are widely or universally recognized, "which enhances its importance as a legal foundation for future elaboration" (Baer 2002, p. 11). One weakness of CBD is its strong emphasis on national sovereignty over biodiversity, without adequate recognition of Indigenous territories (Sustainable Development IWGIA 4/2001, p. 19). Tore Henriksen (2002) connects the CBD articles 8(j) and 10(c) to each other and regards them as two aspects (traditional knowledge and resource use) of the same issues and rights to deal with. In addition, articles 17 and 18 of CBD belong to the same group of articles of relevance in this context (Svensson 1997, pp. 9-10). According to Barsh & Henderson (2003, p. 55), art. 10(d) of the CBD "contains *positive* rights to state support such as funding." Important advances can be made through national legislation and measures. For instance, states need to do research on Indigenous knowledge in order to know what to safeguard and for the maintenance of biological diversity (Henriksen 2002, p. 180). The states have to involve Indigenous groups in overall planning and decision-making in order to ensure that Indigenous knowledge is activated. Thus, Indigenous participation and influence is of relevance.

The ways to reach the common goals can be described, conceptualized and even reached in many alternative ways. Indigenous knowledge provides important angles to many problems of our time. To mobilize alternative ways and views, and meld and blend many facts, is a normal condition regarding the modern scientific and political discourse. John Hassard (1993, pp. 86-87) argues that people can be educated to new (scientific) paradigms. The approach of different Indigenous groups regarding their resource management and self-determination shows, that within the modern political field, the discourse and solutions are of a multi-level and multi-dimensional character (Nuttall & Callaghan 2000; Oskal 2002; Minde 2003; Sejersen 2004; Wessendorf 2005). Generally speaking, the goals are the same.

Foucalt (1980) stresses that cultural practices, many modern disciplines, knowledge systems, etc., are linked with power: they are enactments and avenues of power. Scientific knowledge and Indigenous knowledge represent different knowledge systems in relation to their power position (Eythórsson 1998; Posey 1999). There is a risk that especially the local holders of TEK may become excluded from the avenues of influence (Sejersen 2004; Dahl 2005). It is important that the local Indigenous people have "the opportunity to present their knowledge themselves and participate in the process of defining what is relevant and valid knowledge" (Eythórsson & Mathiesen 1998, p. 218).

Environmental ideology and thinking have gained overall status in the context of environmental and resource planning and management since the 1980's. The new environmentalism has as its aim to "direct and manage scientifically the natural resources for the greatest benefit of human beings" (Heikkilä 2004, p. 140). The activities of environmental groups are in many cases in opposition to the ways and activities of the (local) Indigenous groups. However, in some cases, environmentalism is supportive of Indigenous strivings.

The wilderness concept has had a decisive impact on the discourse and policies surrounding nature and Indigenous lands. According to Roderick Nash (1973, p. 8), wilderness refers in European thinking to "an insecure and uncomfortable environment against which civilization had waged an unceasing struggle" (See also Schanche 2002). The native groups that dwelled on such lands were regarded as uncivilized partly because they were believed to pass through these areas instead of inhabiting them. Nash states that Europeans brought wilderness thinking to North America. On the other hand, the Indigenous perspective on wholeness and sacredness of nature has started to gain acceptance among some researchers and administrators of nature (Björklund 1994; Posey 1999; Berkes 1999; Anderson & Nuttall 2004; Helander & Mustonen 2004). The image of "wilderness" has included a concept according to which wilderness

areas were uncultivated no-man's lands. The Indigenous peoples´ efforts to use these areas in a sustainable way and protect the areas from over-use have not been acknowledged, for instance through relevant law-making (Posey 1999, p. 8; Pedersen 1999). On the contrary, Indigenous peoples are now accused for being non-sustainable and majority wants to maintain wilderness areas "for its own needs of tourism and nature romanticism" (regarding Sweden, Beach 2004, p. 121). Indigenous peoples see the biological diversity in their environment as a significant precondition for the maintenance of their cultural diversity and survival potential. They "depend heavily on natural resources of their own localities" (Berkes et al. 1993, p. 5) because within the context of their practices they use the local resources for their own benefit. It is assumed that biodiversity conservation is the indirect outcome of these practices (Berkes et al. 1993 p. 9). Animals such as reindeer are a key feature related to Indigenous identity.

One problem, not the main problem though, that can be mentioned in this context is the uncritical use of foreign theories (for instance the so-called Theory of Commons by Garrett Hardin, 1968; see also about theory regarding cultural hierarchy, in Åhren 2004) in the management of the Indigenous lands and resources, such as reindeer herding in Norway (see texts by Björklund, Eythórsson and Riseth). Kaisa Korpijaakko 1999, pp. 73-74) brings into light cases and "fabricated theories" from the historical legal field of Sweden-Finland and comes to the conclusion regarding Sami customary law, that "the prevailing theories concerning Sami history are based entirely on too simplified as well as stereotypical assumptions concerning the past." Severe problems emerge also when Indigenous concepts are used tactically by environmentalists against Indigenous groups (see Cruikshank 2004).

One of the big challenges regarding the traditional knowledge is its commercial value. The Indigenous knowledge is sold and only a small part of the income from selling the knowledge and practices come back to the source communities. In addition, the trading can cause internal division within the Indigenous communities (Posey & Dutfield 1996).

Biological diversity means "the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (CBD, art. 2). According to the CBD, *in-situ* conservation refers to "the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings…" (CBD, art. 2).

Biological diversity refers to variety of life on Earth in all of its many manifestations. Thus, the involved states can be said to bind themselves to the protection of all the natural surroundings on earth. States have differentiated responsibilities. It is emphasized by many thinkers and organizations that the goals of article 8(j) cannot be reached if the land and resource rights of Indigenous peoples, and their other basic rights, are not solved (see for instance, Coulter 1997, p. 13; Sami Parliament Report 2004). If one (a certain state and its authorities and law making) is ready to protect Indigenous knowledge and traditions then one also has to acknowledge that Indigenous knowledge and traditions include Indigenous understanding of rights (Lasko 1997, p. 27). In addition, political and economic supports for implementation of the biodiversity goals are important (Posey 1999, p. 550). Furthermore, scientists need to "extend their calculations to seven generations" (Colorado 1996, p. 10) and to approach local Indigenous people and integrate their (Indigenous) knowledge as an equal component to their science (cr. Sejersen 2004; Helander & Mustonen 2004, p. 13). Society at large has to support the overall well-being of Indigenous groups, communities and environments because quality, quantity and durability of Indigenous biodiversity-related knowledge depends on such well-being.

2. Convention on Biological Diversity, art 8(j) and traditional knowledge

International recognition of traditional knowledge of Indigenous peoples and local communities goes back to the World Commission on Environment and Development, also known as the Brundtland Commission after its chairperson Gro Harlem Brundtland. Commission completed its report "Our

Common Future" in 1987. The report meant the beginning of a wider acceptance of non-scientific knowledge in promoting sustainable development and biodiversity enhancement (Burgess 1999, p. 5).

Western scientific knowledge has been long the only accepted path of knowledge since colonization. Indigenous knowledge and methods are believed to be pre-scientific in the sense that they lack or are incapable of objective and dispassionate methods and thought. This belief is "a dreadful stereotypical reading of the knowledge of non-Western peoples, and wholly incorrect" (Deloria 1996, p. 37). The change is now coming from discourses such as dialogue and negotiations between Indigenous knowledge and Western science, and between different disciplines of science, for instance through the meeting of natural sciences with social sciences; and views inside a discipline, for instance inside anthropology and gender studies. According to Thomas Kuhn (1962) science changes over time after it has had a condition of "normality" followed by crisis leading to the revolution, i.e. paradigm shift.

The consequences of biodiversity extend far past the scientific discipline of ecology. There is a need to develop new strategies to understand the complex nature of biodiversity and to apply related scientific findings in an effective and knowledgeable way (deRosnay 1996, p. 596). Traditional knowledge and ways of managing natural resources can provide valid information for sustainable development. "Traditional systems of management have been the main means by which societies have managed natural resources for millennia" (Berkes & Folke 1998, p. 99). For example, the sustainable use of resources by Aboriginal Cree who live in the subarctic region of Canada can be demonstrated by 3 facts: first, none of the species used by Cree has gone extinct since the glaciers departed 4000-5000 years ago, second, all species in harvest are at present found in healthy populations and third, no evidence is found of damage to ecosystem structure (Berkes 1998, p. 99). The use of natural resources by Cree can serve as a baseline for cases in which use of natural resources has lead to decline of biodiversity and decay of natural environment. Also, traditional forms of agriculture support biodiversity at species, populations and ecosystem levels (see also Ramakrishnan 1996).

Until recently, it was rare that people believed resource management based on local practices could make lasting contributions. These views have been changing. Loss of biodiversity and rapid environmental changes, together with the fact that many Indigenous and local communities are situated in areas which are defined as "biodiversity hotspots" and where the majority of the world's plant genetic resources are found have made researchers look for a broader understanding of biodiversity issues.

Henry P. Huntington is one of the scientists who have shown that traditional ecological knowledge "offers ecological information and insights relevant to ecological management and research that cannot be obtained from other sources" and it provides "more specific details" (1998, p. 237 and p. 240). In one of his articles Milton M.R. Freeman (1993, p. 155) describes Inuit as inherently ecological: "they perceive the environment to be a complex system of interacting variables, and they appreciate well that interference with one part of the system has implications for the other parts." Some proponents of traditional ecological knowledge urge "its ecological information and insights must be used in addition to other sources of information if environment and wildlife management strategies are to be effective in both biological and cultural terms" (Huntington 1998, p. 238; see also Caulfield 2000a).

"Knowledge of the environment depends not only on the relationship between humans and nature, but also between the visible world and the invisible spirit world" (Posey 1999, p. 2; see also Huntington 1998, pp. 237-238). All life forms are mutually sustaining. Spiritual aspects and practices are included in the logic of the traditional knowledge (Helander 1992a, Posey 1999) Andrei V. Golovnev and Gail Osherenko (1999, p. 41) explain, regarding the Nenets, that people "find" a rhythm in nature, instead of imposing one onto the environment. Accordingly, reindeer graze best when given complete freedom to move about and find their own food (ibid.). Naskapi hunters "experience a powerful transformation in their contact with animals" (Ridington 1988, p. 99).

There is evidence from several geographical areas that dreams through their informative contents direct native hunters and fishermen (see for instance Helander & Mustonen 2004). According to many Indigenous groups, supernatural beings may have information that is relevant for their subsistence activities, weather prediction, community, dwelling, and migration (see Pentikäinen 1995; Ingold 2000; Saladin d'Anglure 2001). Among the Sami the underground spirits, called Gufihttar, are still very popular. They have impact on choice of the place of a house (Outakoski 1991), and they may have, according to some old stories, information that Sami need regarding coming weather conditions (Kalstad 1994). Gufihttar are able to give weather predictions for a very long period of time. Indigenous groups in Yakutia regulate the amount of bear to be hunted and they avoid eating animals and birds that are sacred (Information from the Snowchange-project, see www.snowchange.org).

As already indicated, traditional knowledge is usage-oriented and best maintained when it is in use by its holders. However, there are many examples of traditional knowledge being used by non-holder and the actual holders get only little or no benefits at all (Posey & Dutfield 1996). When traditional knowledge comes part of public domain, the ownership of such knowledge must be protected. Especially many issues associated with protecting genetic materials have parallels in protecting expressions of traditional knowledge (Lesser 1998). Indigenous people can, in some cases and locations, be reluctant to share their knowledge to Western scientists (Barsh & Henderson 2003, p. 60; Helander 1999a, p. 26). But - "If empowered to maintain and develop their own knowledge systems, Indigenous communities will undoubtedly share a large part of their ecological and medical sciences with other societies" (Barsh 1999, p. 75).

Indigenous ecological knowledge has not in all countries been integrated in research and management discourse. In North America, the research and discourse regarding TEK has already long traditions (Burgess 1999) and has had many successes. In Europe and Russia, the position of TEK is still weak, but the value of traditional knowledge is increasing in these regions as well (among others: Finland: establishment of the Arctic Indigenous Peoples and Sami Research Office at the Arctic Centre, University of Lapland, 2005; RENMAN-project; Snowchange-project; Sweden: ethnobiology and biodiversity research by Ingvar Svanberg and Håkan Tunón; Olov J. Sikku, research regarding predatory animals; Norway: project on Sami customary law (Samiske sedvaner og rettsoppfatninger); Sami value investigation (Edel Haetta Eriksen 2003); Greenland: the SLICA and other projects supported by the Home Rule; Russia: UNEP/GRID-Arendal project on Local Health and Environmental Reporting by Indigenous peoples in Russian Arctic; The Conservation Value of Sacred Sites of Indigenous Peoples of the Arctic, RAIPON, CAFF, IPS, DEPA. In the Draft report from 2002 of the last-mentioned project, it was stated, "joint biodiversity research with Indigenous Peoples on their ancestral lands, although still in its infancy, is proving to be an effective research strategy to address long-term data related to biodiversity" (ch. 2, p. 7).

It must be added, that when implementing the CBD, art 8(j) one also has to take into consideration the other aspects of biodiversity as expressed in the rest of the Convention and also relate the issue to other international documents such as Agenda 21, the ILO Convention No. 169 and the Draft Declaration on the Rights of Indigenous People; UN Convention on Civic and Political Rights, art. 27 (Indigenous People's Biodiversity Network; Barsh & Henderson 2003; Árbevirolaś Sámi Diehtu/Traditionell Samisk Kunskap 1997; NOU 2004:28).

3. Arctic flora and fauna

Characteristics of the abiotic nature of the Arctic

The Arctic ecology is shaped by the severity of the climate and its variability in time and space. The main reason for the severe, cool climate of the Arctic is the low amount of insolation received by high-latitude areas. The angle at which solar rays hit Earth's surface varies with latitude. The duration of sunlight explains the cool climate of the Arctic as well. In Polar regions there are pronounced seasonal variations

in day length due to the Earth's rotation around the Sun and the inclination of the axis. In spite of 24-hour of light in summertime, the polarmost regions are consistently cold because they always have low Sun angles. Low-angle rays must also pass through more atmosphere than high-angle rays; thus, the former are subject to more depletion through reflection, scattering and absorption. In addition, much of the sunlight is reflected by snow and ice. The energy deficit (between the poles and 35th latitudes) areas get more energy from the low-latitude energy surplus regions and cause the global oceanic and atmospheric circulation. Due to this, the Arctic has a significant influence on global climate patterns. For example flows of deep layers of water from and to the Arctic Ocean influence global climate, as well as does the sea ice across the Arctic basin.

There is great variability in the climate of the different Arctic regions. Most of the rain in the Arctic falls as snow. Temperature varies between continental and marine regions of the Arctic, so that continental areas have far more extreme temperature changes than marine regions. Despite of little rain in the Arctic summer, low summer temperatures inhibit the rain evaporating, and permafrost prevents water from draining into the ground, supporting the formation of hydrophilic ecosystems. Nowadays, the areas of permafrost reach far more south in the areas of continental climate than in more coastal areas.

One major climate factor affecting the ecology of the Arctic nature is wind, for example by making in winter the bare-ground-spots on upwind slopes and large snowdrifts on downwind slopes. This has a tremendous effect on the vegetation patterns on the tundra –shrubs and dwarf trees have to grow low to the ground and buried to the snow to avoid the frostbites. In addition, all-year-round active animals, like Norway lemmings (Lemmus lemmus) and rock ptarmigans (*Lagopus mutus*) look for shelters from the snowdrifts.

Adaptations to the cold and snow among Arctic fauna

Adapting to the cold and snow is essential for the animals living all-year-round in the Arctic. One physical adaptation is larger size: the rate of heat loss is proportional to the surface area of the body. For example, bears like polar bear (*Ursus maritimus)* and Kodiak brown bear *(Ursus arctos middendorffi)* are much bigger than closely related bears living in milder latitudes. Another physical adaptation is that in endothermic (warm-blooded) species, the relative size of exposed parts of the body -like tails, ears, limbs and beaks- decrease with decrease of temperature. This applies, for instance, to arctic fox (*Alopex lagopus*), snowshoe hare (*Lepus americanus*) and arctic hare (*L. arcticus*). For larger animals, thick under haired and seasonally changing fur is a good way to keep a layer of still air, which prevents convection, against the body. The white fur colour is also a good way to hide from the predators; so many northern species have evolved to change the colour of their fur/plumage. In fact, Arctic animals have many physical and morphological adaptations for living in cold and snowy environment. Mountain hare (*Lepus timidus*) as well as wild forest reindeers have for example broad feet/cloven hooves that will not sink in soft snow. Many of the Arctic animals hibernate in the wintertime under the snow. Living under snow is a way to survive in the cold Arctic winter for example to lemmings and voles, which are active throughout wintertime, but cannot carry thick enough fur to live above snow.

Ecosystems

The Arctic ecosystem as a whole, as any other ecosystem, is not isolated from the rest of the globe, but it grades into warmer southern regions of the world and interacts with them. The southern board of the Arctic is located in the world's largest terrestrial biome, taiga or the transition zone from the taiga to tundra, so called forest-tundra.

Characteristics for the taiga forest and the northern part of it, forest-tundra, is the cold-temperate boreal climate, which means permanent snow cover on the ground several months in the winter. The average growing season is less than 6 months. In the northern border of taiga (= treeline), the average temperature in the warmest summer month is about +10°C. The physical aspect of the taiga is that of a mosaic of forests, lakes and rivers, along with wetland such as peat bogs. Taiga forests are dominated by coniferous

trees (*Pinus* spp., *Picea* spp., *Abies* spp., *Larix* spp. etc.) 15-30 m in height. In some places, deciduous trees interrupt the coniferous cover. These deciduous stands are of limited variety (mostly birches (*Betula* spp.), poplars and aspens (*Populus* spp.), and often represent following a forest fire, which leads the forest to the beginning of the succession pattern. The root systems of trees like larch (*Larix* spp.) and spruce (*Picea* spp., *Abies* spp.) growing in the northern taiga are shallow, which allows them to take water from the ground, right when the frost begins to melt in spring. Symbiotic relationship with fungi is essential for the vascular plants (especially for the coniferous trees) of the taiga/forest-tundra/tundra living in the limit zone of their existence. Fungal fruiting bodies and lichens (symbiotic relationships with algae and fungi) are also an important food source for the wildlife - like reindeers – in the Arctic.

The efficient intake of the water and nutrients by the trees explains the sparse undergrowth beneath the forest canopy. The field layer is dominated by dwarf shrubs like willows (*Salix* spp.), bilberry (*Vaccinum myrtillus)*, lingonberry (*V. vitis-idaea*), crowberry (*Empetrum nigrum*) and heather (*Calluna vulgaris;* distribution is limited to the Eurasia). The ground layer is usually covered with a complete growth of mosses and lichens and a considerable accumulation of decaying needles as well. Faunal species diversity is limited in the taiga forest, because of the limited food supply for animals due to harsh climate, floristic homogeneity, and slow plant growth. Birds are numerous. Nearly all migrate to milder latitudes in winter. Insects are nearly absent in winter but superabundant during the brief summer. Mammals are represented by some species of ungulates (elk, caribou, and wild forest reindeer), hares, rodents and carnivores like fox, wolf, brown bear and a few species of the weasel family.

The forest-tundra is very sensitive for disturbances like fire, insect-outbreaks or even short-term climate fluctuations. The treeline reacts fast to the disturbances. For example in the mountain birch woodlands in Fennoscandia, geometrid moths (*Epirrita autumnata* and *Operophtera brumata*) cause large-scale defoliation and dying of the birch stands at intervals of about a decade. The latest outbreak has been going on in the Finnish, Swedish and Norwegian Lapland since 2003 and in Finland, the area of destruction covers thousands of square kilometres in summer 2005.

Human impacts for taiga and forest-tundra ecosystems concentrate mostly to the southern parts of the regions, so that the forest-tundra is less exploited than boreal forest. However, commercial logging operations advance towards the forest-tundra across much of the boreal region. In addition, dams, roads, mines, oil and gas production, pipelines, tourism and so on disturb more and more the functionality of boreal ecosystems by causing fragmentation of habitats, destruction of migratory corridors and disruption of permafrost, water flow and nutrient cycling. Habitat fragmentation and habitat loss due to intensive forestry, together with hunting, have had heavy negative effect on the populations of capercaillie (*Tetrao urogallus*) in Fennoscandia. Capercaillie is the typical species of the taiga area and culturally very important and valued game bird. The centre of its' area of distribution is situated in Siberia, where the courtship populations are still in connect with each other, but in Fennoscandia the situation is alarming. The courtship arenas have been isolated (due to the reasons explained above) from each other in many regions and risk of local extinctions is high if the situation stays same. The northern taiga and the forest-tundra are very sensitive ecosystems to disturbances because so many species living there are in the limits of their distribution.

The tundra and the polar desert are situated in higher latitudes from the forest-tundra. The climate is cold: summer is short and snow covers the ground for at least 6 months/year. Furthermore, the average temperature for the warmest month can be as high as 10°C in areas near the treeline. The soils lack of nutrients and are wet, poorly developed, with a thick layer of organic material on top of it. The tundra vegetation is treeless and gradually changes from the tall-shrub-tundra (typically willows (*Salix* spp.) and dwarf birch (*Betula nana*) to low-shrubs and more sporadic towards north and the polar desert. The polar desert is mostly bare rock and ground, situated in areas where there is not enough moisture and warmth to sustain extensive plant cover.

The tundra is a mosaic of a wide range of local habitats, which support diverse species and the local distributions of floral and faunal species vary widely. In summer, the tundra swarms with life, migratory birds and animals arrive, insects abound and vegetation flourishes in the constant daylight. In contrast to that are the dark winters, when tundra is nearly inactive and migratory animals have left for milder areas and some mammals, for example marmots (*Marmota* spp.) hibernate, while only a few stay active (for example lemmings and arctic fox). Characteristic to the animal life of the tundra is the fluctuating populations, lemming being one of the most important.

The tundra and the polar desert interact closely with other parts of the Arctic system, as well as with the other parts of the world. For example, freshwater ecosystems are found in much of the tundra and their role to the functionality of the terrestrial tundra is vital. For example, many insects living in the tundra spend most of their life cycle in an aquatic environment. The enormous swarms of insects provide food for the migratory birds. This links the Arctic to the temperate and tropical areas. These migratory birds include also grazing birds, like ducks and geese, which have been very important for the people living in the Arctic. Changes in wintering habitats of these birds have also effect on the life in the tundra: for example lesser white-fronted goose (*Anser erythropus),* which used to be the most common species of geese in Finnish Lapland before the Second World War, is now globally threatened. Hunting in the wintering grounds, on migration and in the breeding grounds has proved to be the main threat to the populations of lesser white-fronted goose.

Permafrost influences strongly the landscape and vegetation of tundra and polar desert. Climate change is already affecting the expansion of the forest northward, and permafrost melting has been reported from the Arctic tundra. These both lead to disturbances in tundra vegetation and again in animal and human life in the Arctic. The latest report from the Siberia tells that the world's largest frozen peat bog in the tundra is melting. Melting of the permafrost in Siberia has an effect on a global scale, because methane, which is 20 times as potent a greenhouse gas as carbon dioxide, trapped in the permafrost is being released into the atmosphere.

The functionality of the Arctic tundra and the polar desert ecosystems is threatened by many of the same human activities as the forest-tundra, but with the impacts being even more severe. Because the tundra vegetation is very vulnerable to physical disturbances, vehicle tracks, and construction of roads and pipelines cause widespread destruction of the vegetation and severe erosion. That leads to long-term effects such as loss of species richness of the tundra. The traditional use of tundra as well as other factors can also cause problems for the survival of the wildlife.

Industry produces pollutants like heavy metals, persistent organic pollutants, oxides of sulphur and nitrogen, and radioactive contaminants that can be transported long distances so that their source can be far away from the Arctic. These pollutants particularly affect the tundra and polar desert. Acid rains can change the type and extent of the vegetation, radioactive contaminants and heavy metals accumulate for example on lichens and cushion plants, from which the pollutants end up in grazing animals like reindeer and caribou and again in the carnivore animals and humans. The increasing industrial activities in the high Arctic, such as mining, and oil and gas development with huge constructions of infrastructure around it, have also far-reaching negative consequences to the functionality of Arctic ecosystems.

Freshwater ecosystems are an important component of the Arctic landscape and they interact tightly with terrestrial and marine ecosystems. Fresh water is an essential part of the water and nutrient cycles. Fresh water is stored in ponds, lakes, glaciers and so on. When the water moves, it releases substances it obtained from falling air pollution when it fell from the air picking up others from where it flows. Arctic lakes and ponds are typically covered with ice for over 6 months/year and the shallow basins may be frozen solid. In deeper basins, biological activity continues slowly through winter in the unfrozen water under thick ice. The glaciers and ice caps with their accumulated snow hold significant portion of the global fresh water resources. The biggest rivers in the Artic area are situated in Siberia and North

America. The rivers change the landscape by both eroding it and by accumulating soil on the riverbanks and deltas.

The fresh water systems also support diverse flora, fauna and microbes, which form complex food webs linked with the other ecosystems. For example anadromous fishes, like Atlantic salmon (*Salmo salar*) and Pacific salmons (*Oncorhynchus* spp.) spawn in fresh water, but live part of their life cycle in the ocean. Also some marine mammals spend part of a year in fresh water environment. For example, beluga whales (*Delphinapterus leucas*) use estuaries and river mouths for molting and calving. The freshwater ecosystems have an important role for humans living in the Arctic: the rivers and lakes are transporting routes, a source of food, energy, raw materials and drinking water. Regrettably, water ecosystems serve as dumping places as well.

Accidentally, in salmon transported from Sweden to Norway in 1975, the Arctic was introduced to a new parasite, *Gyrodactylus salaris.* It is an ectoparasite, which mainly lives on the skin of freshwater Atlantic salmon. The parasite has infected 38 riverine systems in Norway so far and the salmon stocks in the infected rivers have, with few exceptions, been practically eradicated.

Climate change has affected the fresh water ecosystems and wetlands of the Arctic. The warming climate is thawing the normally frozen soil, or permafrost, that makes the lakebeds watertight. This in turn allows the water to drain away and makes thousands of Arctic lakes disappear. The loss of these lakes endangers native plants and animals, as well as many species of migratory birds that breed and nest around them. It can also threaten the livelihood of people who use the lakes for hunting and fishing. Temperature changes also affect evaporation, snowfall, and the thickness of the ice cover in the lakes, rain and stream flows. Because the Arctic animals and plants in freshwater ecosystems and wetlands, as well as in terrestrial and marine ecosystems, are living on the limits of their existence, they are likely to be endangered in warmer conditions because of the new competing species and change in their habitats.

Several physical factors combine to make the Arctic marine systems unique including a very high proportion of continental shelves and shallow water, a dramatic seasonality and overall low level of sunlight, extremely low water temperatures, presence of extensive areas of sea-ice cover and a strong influence from freshwater coming from rivers and ice melt. The significant variability of the Arctic marine environment over longer periods as well as year-to-year is largely due to these physical factors. The sea ice is important for many marine mammals like seals (for example for molting) and their predators, polar bears, as well as for ice algae as a habitat.

The marine ecosystem interacts with terrestrial ecosystems such as with migrating birds and animals. For example grey whales (*Eschrichtius gibbosus*) migrate from their breeding areas in subtropical regions to Arctic feeding areas, arctic foxes scavenge on the sea ice, but breed on land, and polar bears, which spend most of their life on sea ice, den in snow banks on land. Also rivers connect the marine environment to the land and changes there, for example causing more nutrient flow, change life in the ocean as well. Connections the other way round exist as well.

The first commercial exploiters of Arctic marine resources were whalers, fishers and sealers. Whale stocks have been overexploited since and many of the whale populations are endangered. Commercial fishing has also caused steep declines in many wildlife populations for example in the Bering Sea. The continuing decline of many seabird and marine mammal populations indicates an ecosystem in trouble. Diminishing numbers of fish without a corresponding decrease in the fishing effort eventually leads to a population collapse. Sustainable use of the marine resources would also help the people living in the Arctic survive. Oil and gas development, mining and other industrial activities cause pollution to the Arctic Ocean. Especially heavy metals, like cadmium, mercury and lead, and persistent organic pollutants (POPs) have been a huge problem in the Arctic, because they concentrate in the fatty tissues of the Arctic animals causing problems in reproduction and immune system. As a top predator, polar bears (as well as

humans in the Arctic) are exposed to high levels of these pollutants through their food.

Climate change has already affected the Arctic marine life, for example, it has reduced the sea ice area significantly. This affects not only the breeding and migration of animals, but also the sea algae, plankton and fish. Changes in seasonal patterns of sea ice would also affect erosion, the ocean currents, weather patterns and by interactions to the other ecosystems and the Arctic marine ecosystems, on the global scale, as well.

4. The state of retention of traditional biodiversity-related knowledge and identification and assessment of measures and initiatives to protect, promote and facilitate the use of traditional knowledge

4.1 The state of retention of traditional biodiversity-related knowledge

4.1.1 Flora, fauna and ecosystems

Those **Sami** and other Arctic Indigenous people living in the traditional areas with close contact with nature have good possibilities to observe and learn about biodiversity and maintain their biodiversity-related knowledge. Knowledge is connected to respect. Some Indigenous Elders mean that "if respect through knowledge" is shown, the habitats and species will be taken care of (CAFF, Conservation of Arctic Flora and fauna 2001, p. 69). Traditional food and use of traditional medicine also help to maintain the traditional knowledge. Salmon is a concern regarding the northern waters. It has a certain value in salmon tourism. On the other hand, the natural salmon, for instance the Atlantic salmon in Deatnu/Teno River, a border river between Northern Norway and Finland, has lost its market value in many areas. Those who fish salmon have maintained good knowledge about the behaviour of salmon, where to fish salmon, the favourable fishing conditions, and other factors. In addition to fish, northern people use shrimps, animals, birds, plants, etc., as food and medicine. Especially in old times, people used all parts of fish and other food ingredients. For instance, the Gwich´in use the dried backbone of the fish for eating, and for bait to trap fox, marten and mink (Andre 1994, p. 15). Catfish was earlier used by Sea Sami in Deatnu/Tanafjord as food for cows. These days it has been used as food in the household.

Salmon has maintained its value as cultural food and identifier of many people in the Arctic. Generally speaking, distinctive food is a cultural identity marker (Freeman 1996). The right to continue to harvest and eat traditional food is very important for the Indigenous people. Shared local food helps to maintain social ties and connects many people to their place of birth. It is crucial that Indigenous groups have continued access to the resources in their natural environment. For instance the Sami on the **Kola Peninsula** are excluded from their traditional salmon fishing areas (CAFF, Arctic Flora and Fauna 2001, p. 73), which has an overall negative impact on their possibilities to conduct traditional fishing and maintain their traditions and knowledge regarding salmon (Deatnu Luossa Seminara-Deatnu Salmon Seminar, Report 2003). Their identity becomes threatened as well. Commercial fishing, over harvesting, recreational fishing, and fish farming have negative impact on the wild Atlantic salmon and some other fish species. Atlantic cod is important as food and commercial fish for many Arctic groups. In **Greenland,** for instance cod is used both commercially and for use in households. Cod is frozen or dried. The roe is smoked and cod liver is made into oil. In many coastal and fjord areas in **Northern Norway** cod has been an important factor in supporting local fishing communities. The Atlantic cod population has been decreasing in many areas of the Arctic (CAFF, Conservation of Arctic Flora and fauna 2001) partly due to the climate change factors (The Biodiversity of Greenland 2003).

Much knowledge is lost about the medicine plants, for instance in **Northern Russia and Sápmi** in Northern Europe (CAFF, Conservation of Arctic Flora and Fauna 2001; Helander 2002). Willow is one of the plants that many people still know about. Among the Sami, it is still used as medicine, a ceremonial plant, and as a wood to smoke meat and fish. In many areas of the Arctic, the bark of the willow is used to

tan reindeer skin. Willow fungus has been used by the **Gwich´in** to repel mosquitoes (Andre & Fehr 2001). Also berries, such as blueberries, cloudberries, and cranberries are still used in the Arctic as food and medicine (CAFF, Conservation of Arctic Flora and Fauna 2001; Andre & Fehr 2001).

In many cases, it is difficult to estimate the exact numbers of certain species. For instance in Western Greenland, the amount of common eider is estimated to be between 10,000-100,000 breeding pairs in 1996. The populations of Western Greenland and Arctic North America are probably declining, as the populations in Russia seem to be stable. According to the **Greenland** Institute of Natural Resources there are 39 animal species that need special attention as they are exploited. In the Biodiversity of Greenland, 25 of these species and their use are described in detail. For instance, cod, trout, guillemot, ptarmigan, caribou, shellfish, shrimps, arctic tern eggs, muskox, polar bear, seal, beluga whale, Greenland halibut, minke whale, rockfish, salmon, arctic char, and eider are used as food as well as many berries and plants (Kleivan 1996, The Biodiversity of Greenland 2003). For local Inuit, seal hunt is a cultural act and brings them food, skin and cash. Hunting and fishing give also continuity to the Inuit identity (Kleivan 1996). Traditional food helps to maintain the Inuit identity and it promotes social networking and values regarding sharing and giving (Kleivan 1996, p.147). CAFF (Conservation of Arctic Flora and Fauna 2001, p. 47) has emphasized the importance of protection of many of the above-mentioned species.

Many Indigenous people still consult their dreams and use them in their hunting and fishing activities. Evenk Elder, a wolf hunter and reindeer herder, says that sometimes it is possible to see bear in his dreams and this is a sign of good hunting luck. Seeing a fish in a dream means that hunters will get wild reindeer. There are various animals that cannot be hunted at all and strict hunting quotas are in place for animals like bear. One can hunt only certain amount of bears during his or her lifetime. There are also some specific regulations and ceremonies connected with hunting of some species. Vladimir, a bear hunter from Iengra region, southern Sakha, emphasizes that it is not possible to use the name of the bear, but one has to use nicknames when talking about the animal. The Yukagir believe that the swan is a holy bird and thus they never hunt or kill it. (Dreaming and hunting text from "Sakha Republic Biodiversity and Local Knowledge" by Kaisu Mustonen & Tero Mustonen 2005.)

While Indigenous peoples are still concerned how to protect their environment and get subsistence on their lands, the majority societies in certain Arctic areas are concerned of predators. In **Finland and other Nordic countries** there is much discussion going on about the well-being of predators, such as wolf, wolverine, bear and eagle. The Finnish official predator policy makes sure that the amount of predators increases while the amount of reindeer decreases (Aikio 2002, p. 38). In **Swedish Sápmi**, lynx is found in the entire reindeer herding area. According to CAFF, Conservation of Arctic Flora and Fauna (2001), the population of wolverines in Fennoscandinavia is stable and the population of brown bears has increased. Anna-Liisa Sippola (2002) writes that the population of wolves are declining and the wolf is endangered in Northern Finland as well as in Northern Norway and Northern Sweden. In Finland there are about 100 wolves and in Sweden about 70 (CAFF, Conservation of Arctic Flora and Fauna 2001, p. 234). European Union promotes a radical increase in wolf numbers. In Russia and North America the amount of wolves and wolverines is abundant.

Regarding predators: Among the **Sami**, the meaning of animals is connected to the consciousness of overall balance in nature where all species have a certain role. For many local Sami people the main animals of interest are, in addition to reindeer, some game animals, such as moose, ptarmigan and some other grouse species. Small animals such as fox are also hunted. These days, ermines are normally left in peace. Arctic fox has become a very rare animal and is seldom seen. Regarding predators, people accept that wild animals take a reindeer or two, now and then (Sikku 2000, p. 204). However, they are regarded as competitors and large amounts of predators are not tolerated within reindeer herding areas (ibid.). Sami reindeer herders monitor predators (Aikio 2002, p. 38) and establish ways to live with them (Sikku 2000). Niillas Vuolab, a reindeer herder from Utsjoki, Finland, born in 1917, tells: after World War II, "we had

to herd the reindeer constantly because of these predators. If a pack of say, ten wolves would come hunting, with one single attack they could take ten reindeer. Another attack or another pack, and it would be another ten reindeer!" (Helander & Mustonen 2004, p.294). According to the reindeer owners in Sweden, the number of predators is growing in reindeer herding areas (Sikku 2000, p. 204). "The damage to the herds has at least two sides; one economic side and one emotional side. Most of the attention has been paid to the economic impact (Jernsletten & Klokov 2002, p. 120).

Many of the forest areas of the north as well as the tundra and the polar desert areas, and the inland and seawaters are protected as national parks, wilderness areas and nature reserves. Both national and international agreements, land and water use regulations, assessment and monitoring programs, research and documentation activities, local management efforts, and other measures to maintain the species and balance in nature are of great value. It seems however that climate change, environmental contaminants and pollution, some human activities and ozone depletion are counteracting different protection programs and agreements.

4.1.2 The meaning of birch

Sami usage of birch

The northernmost European forests are located in four countries: Norway, Sweden, Finland and Russia. In northernmost Europe Sami have been "boreal forest dwellers "for time immemorial using the forest resources in hunting, trapping, reindeer herding, gathering, and for fuel (Baer 1996). Northern forest resources have been of interest to the local peoples and to commercial and industrial institutions, public and private. There is growing competition with the local Sami over the space, access to, and control of the mountain birch forests (Műller-Wille et.al. 2001). It is truly important to understand that the concept of environment consists of not only ecological factors but also many other factors such as cultural, social and linguistic factors that have to be taken into account in resource management. Traditionally, each Sami family or kinship unit had their own territory, and areas for different needs and activities (Helander 2001; Aikio & Műller-Wille 2002).

Birch has been and is used for firewood instead of oil or electricity. Sami have applied careful management of "homestead birch forests" in order to promote the continuation of the use of birch to secure fuel and material. These forest resources have been utilized for centuries under traditional and precise model actions. Various separate areas are used in temporal cycles. Some cycles are short, some 10 to 20 years, some long, up to 100 or more years. The length of the cycle depends on the growth of birch, type of landscape, soil quality, and climate conditions in a specific area. These cycling intervals also assume the availability of other wooded areas as a substitute resource. These shifting or rotating patterns reduce the pressure on firewood lots, which are essential for local people (Aikio & Műller-Wille 2002).

The very first step in the assessment is what trees are to be left standing for future use. These trees are the most healthy, straight, beautiful trees which have no viruses or other kind of physical damage. This decision depends on the environmental conditions and the layout of landscape. Certain trees are left to grow to protect animals, other plants and soil against wind, snow and ice, water, erosion, sun exposure and other impacts. All of the trees are never cut down at the same time in the same area (Aikio & Műller-Wille 2002). The time of felling during the moon and annual cycle affect the quality of wood. The process of drying is also important. Leafed branches are left to pull the juice from the tree trunk. In **Ohcejohka (Utsjoki), in Sápmi area of Finland**, traditional early summer felling without cutting limbs is still practiced. The right time to cut the trees during the summer season is when the moon is on the wane. At this time, the felled trees would not rot and produce prime quality firewood. Early summer felling also encourages new growth. The exact and proper timing of felling birch trees has been tested and is passed to new generations (ibid.).

Certain areas are excluded from the removal of firewood. For example, places close to water springs are

protected from the felling. Along the shorelines of rivers, birch trees are left for ice-breakers. These rules protect the tree itself and provide protective habitats for birds and many other animals. Birch forests are holy places for Sami people, inhabited by spirits as part of the underworld. Sami stories also contain advice on how to treat wood. The story of the spirit "Ruoidna" provides a reflection on their knowledge of illnesses in trees caused by rotting, mould and mycelium. Cleanliness and observance are important factors in firewood production. The story advises not to take any rotten tree to the "goahti" (=homestead) because the Ruoidna spirit would bring bad luck (ibid.).

In addition to securing heat and warmth, mountain birch is used for arts and handicrafts. For instance, there are a number of craftsmen who still know how to make the "geres"- the reindeer sled whose production requires special skills and knowledge. Identifying the right and suitable wood for art and handicraft is a detailed study. When the right tree for handicrafts is found, it may have not grown tall enough yet or the moon may not be right, or for some other reason it is not cut down, the location has to be kept in mind. Sometimes other trees around are felled in order to provide the selected tree optimal growth conditions. The chosen tree is cut at the right time of annual and lunar cycles. This ensures that the quality of wood is good. Felling of trees cannot be done during the black moon or new moon, which cannot be seen. This is because wood, which is felled during that time, will rot. This way of thinking is part of the spirituality, reflection for other living beings, and the world in general. "The habit to knock slightly on the tree by axe or knife three times is a remnant ceremonial behaviour to show respect and to ask permission to use the item" (Aikio & Műller -Wille 2000).

Birch is an integral part of the physical environment in Sápmi. Availability of good quality birch is very important for the economic activities and livelihoods of local people, as well as for well-being and spirituality. "Furthermore, working with the birch continues the richness of ecological knowledge through applying environmental observation of changes which occur in nature and with animals and plants. All these aspects contribute to the cultural and socio-economic well-being of people in their specific environments" (ibid.).

Sustainable management of timberline forests
Mountain birch is one of the species expected to benefit from climate warming. If the tree-line forests expand, mountain birch will provide important source of resource for Sami and local people living at the timberline in the future. Recent observations show that the upper, natural climatic birch treeline of Fenno-Scandinavia is slowly increasing and the trees close to tree line grow higher and denser than a few decades ago (Wielgolaski 2001).

It is accepted that regulations are needed. "More people, on the inside and from outside, show different interest in the same resource in the same place at the same time" (Aikio & Műller-Wille 2002). There is a need to formulate management plans that draw from both Indigenous ecological knowledge and scientific assessment. Management policies, decisions and recommendations should come from the people living at treeline. Mountain birch has paramount importance for the local people as a part of their physical environment and traditional ecological knowledge. New types of management can be achieved through extended local guidance and control, such as the Sami siida system or local associations and governments, over the various types of land users in forestry, sport fishing, hunting, tourism and recreation. For example, when establishing and monitoring protected areas local traditional ecological knowledge, experience, and land-use practices have to be accepted and integrated (Wielgolaski 2001). (From "The Meaning of Birch" by Inkeri Markkula 2005.)

4.1.3 Health, medicine, shamanism, and plant knowledge

The well-being of northern peoples presupposes many things, such as access to native food, maintenance of spiritual traditions, a feeling of control, local participation, governance, capacity, and continued subsistence activities on one's own lands. The research made in **Russia** among the Indigenous peoples

shows that health requires a state of balance between environmental factors, cultural factors and various components of the Indigenous life (Arctic Indigenous Peoples and Traditional Way of Life, RAIPON 2002; see also www.raipon.org). One should address a combination of varied factors when discussing health and remedies.

The consumption of traditional foods plays an important part in the health and well-being of Indigenous people in the Arctic as Receveur, Baulay, and Kuhnlein (1997) found in the study they conducted in 16 Dene/Métis communities. They found that on days when people ate both traditional and market foods, their diets were better than when they ate only market food. Their work showed that the traditional food system is still used extensively by the **Dene/ Métis** communities. Elders state that the health of young people would improve if they would use more traditional resources and less market foods, which are limited in variety and quality (Kuhnlein and Turner, 1991). This is especially prevalent in the Arctic regions where shipping distances and costs makes market foods, especially the nutritious foods, more expensive. "Since market foods are much more expensive in many northern communities than in the south, traditional food provides many components of a quality diet at relatively low cost" (Dickson, 2003). "Besides its nutritional values, the traditional diet is also a source of cultural strength and is critical for the social, mental and spiritual well-being of individuals and communities" (Dickson, 2003). Promoting traditional foods would encourage the use of traditional knowledge while improving the health of Indigenous people.

In addition, conducting this research on Indigenous foods and related traditional knowledge would benefit and assist in the protection of the environment (Kuhnlein and Turner, 1991). The knowledge Indigenous people have regarding the health of plants and animals can be developed for environmental monitoring (Kuhnlein and Turner, 1991). Paci et al., (2004) states, "that as the climate changes so too will food security. If it warms or cools there will be impacts on the relative abundance and scarcity of some foodstuffs." More research that engages Indigenous people with regional, national, and international processes on food security and climate change are needed (Paci et al., 2004). For example, a current study provides data for future research into food contamination. This study by Batel et al., (2005) of 18 Indigenous communities in **Denendeh** and the **Yukon** found that traditional food is still a major component of their diet. The study provided a detailed description of the traditional food system and the nutrient intake in these Indigenous communities. This will help future research examine the contamination exposure Indigenous people have to pollutants in their food system.

Among **Sami**, as well as among many other Arctic groups, there are still healers and shamans who use a combination of many remedies and ways: herbs, spells, laying-on-of-hands, healing from distance, prayers etc. Sacred sites and their protection for Indigenous use are of importance when discussing traditional medicine. In the West, traditional medicine is a complementary procedure to Western medicinal practice. In some areas of the East, however, local healing activities are the only ways to cure people in their daily situations. There is an increasing interest in traditional medicine, but at least in the **Nordic countries** in Europe, there is a need for formal education concerning healing and traditional spirituality. Many northern plants, trees and roots are still widely used as medicine: among them birch, juniper, birch and willow fungus, yarrow, blueberry, cranberry, reindeer lichen and muskeg.

One role of healing and health care is to educate local medical doctors and healers. Disease and health have to be placed in a cultural context. There is a need for medical doctors who can speak local Native languages. "To offer a service where the individual feels comfortable, both culturally and linguistically, is to grant greater and fairer accessibility to those who need it" (Kvernmo 1997, p. 136). There is a growing trend to use traditional medicine in modern health care. For instance, in **Norway** (Tromsö) **Sami** traditional healing is used in the context of official Western medicine. The Norwegian Ministry of Health and Social Affairs has actively supported development of modern health services in the Sami areas (AHDR 2004; Hanem 1999; Skott 1996).

In 2000, the Russian Association of Indigenous Peoples of the North, RAIPON, initiated a project to gain knowledge of and enhance the protection of sacred sites. In 2004, a report was published by CAFF, entitled "The Conservation Value of Sacred Sites of Indigenous Peoples of the Arctic." This report advocates the participation of Indigenous peoples when determining protection strategies. More research and documentation is needed to understand the meaning of sacred places in relation to maintenance of biodiversity-related knowledge. Many people link discontinuation of customary livelihoods and the disintegration of sacred sites use and management (CAFF Technical Report No. 11, 2002). Many sacred spots are placed on the traditional herding routes, near fishing waters, various roads and paths, etc., and constitute an important part of the cultural infrastructure of Indigenous groups.

Shamanism has close links with animism and other manifestations of local knowledge systems in which nature is seen as alive and all things, living and non-living have spirit. Juha Pentikäinen a well-known scholar of Siberian shamanism has called Eurasian shamanism the deepest manifestation of ecological knowledge and relationship between human society and the surrounding world (1988). Northern shamanism and healing presupposes close contact with nature and good knowledge of ecological surroundings. Shamans and healers are well-rooted in their natural surroundings. In community-based observations and documentation of climate change shamans play a key role as they carry their cultural and weather knowledge with them. One role of the shamans is to maintain the traditions including places to gather medicinal herbs and items. Their mind-set and activities contribute to maintain the traditional knowledge and observation skills.

During the community work in April 2005 in Iengra, Southern Yakutia an assistant to an Evenki shaman, Oktjabrina Naumova (2005), explained some of the dynamics and aspects of the living tradition: "I was born into a nomadic family of the Evenk. I work as an assistant to our shaman. He is the most powerful shaman of our times. People who are sick come to the shaman. Our shaman knows everything through his helping spirits. During the ritual we make a fire. The spirit of the fire has to be present always. We throw certain plants, like Labrador tea (*Ledum palustre*) to the fire, followed by a feather of swan. Then we throw blessed water to the fire and only after that the drum comes out. After the ritual everybody present is healed. Our shaman has multiple methods of healing. Northern star, moon, sun, swans, ducks help him – but of these, the spirit of the bear is the most powerful." (Text on shamanism from "A Special View on Shamanism and Spirituality Shamanism in Yakutia" by Kaisu Mustonen & Tero Mustonen 2005.)

In **Canada** there are many initiatives promoting traditional medicine. The National Aboriginal Health Organization (NAHO) is an Indigenous designed and controlled organization governed by First Nations, Métis, and Inuit organizations of Canada that places traditional medicine as central to their mandate (Hill 2003). The NAHO mandate is to advance the health and well-being of Indigenous peoples in Canada and has three Centres of Excellence for the First Nations, Métis, and Inuit. The Ajunnginiq Centre has the objective to improving the physical, social, emotional and spiritual health of Inuit and their communities. One of their projects is to affirm and protect Inuit traditional culture, environmental and health-related knowledge, and healing practices. The centre is building relationships with knowledge holders and creating links between knowledge holders and traditional healers within Canada and internationally to protect and promote traditional knowledge (O'Hearn, 2005).

In the **Yukon Territory, Canada** the First Nations Health Programs (FNHP) operates at the Whitehorse General Hospital, as the first of its kind in Canada. The FNHP is comprised of seven programs for Indigenous people in the hospital that ensures quality and culturally sensitive holistic health care. Two of the programs, the Traditional Diet Program and Traditional Medicine Program specifically incorporate traditional knowledge of the **Yukon First Nations**. In the Traditional Diet Program, traditional foods such as moose and caribou are provided and families are encouraged to provide foods that are not available thought the hospital food services. In the Traditional Medicine Program, complimentary healing methods are provided under the direction of a First Nation Elder's Working Group and assisted by the Traditional Medicine Program Coordinator to access the traditional methods of healing. There is a healing

room available for the patient and family members to gather to pray and practice traditional ceremonies and private rituals. Accommodation is also provided to Indigenous families to allow them to stay overnight in times of need. These programs and centres are examples of how traditional healing and Western medicines are capable of working together and complement each other ensuring that the local traditional knowledge of Canadian Indigneous peoples are maintained and preserved (see A best practices model 2002, & Whitehorse General Hospital: First Nations Health Program at http://www.whitehorsehospital.ca/programs/ENindex.html).

4.1.4 Land and resource use; land and resource use management

Reindeer herding is one of the occupations that are regarded as central for the viability and maintenance of the **Sami** culture in many Sami areas. The reindeer herding area in **Norway** consists of 40 percent of Norway's total geographical area. In 2001 there were 165 000 animals (Jernsletten & Klokov 2002). The *Reindeer Herding Act* regulates reindeer herding in Norway. The general rule is that only Sami can practice reindeer herding in Norway. 10-15 percent of the Sami work actively within reindeer herding. Reindeer herding consists of many different kinds of tasks. One herder does not have all knowledge and capacity that is needed in reindeer herding. Báiki (family; close relatives) represents an independent unit, which has all the skills and knowledge necessary to manage the herd (Betydning av produksjonsfaktorenes sammensetning 1990, p.9). In Norway a government bill reintroduces some aspects of Sami customary law in reindeer herding legislation and reintroduces 'siida' as the fundamental unit in local reindeer herding organization (Åhren 2004, p.77). Management of reindeer herding has some major weaknesses, for instance there is a need to include herders in overall management regime at all levels (Forbes 2004) and there is lack of knowledge among administrators (Björklund 1999, p.25). Johan Klemet Haetta-Kalstad (1996, p.29) offers a solution and declares, "Traditional knowledge as a premise will imply an industry embedded in Sami culture." Furthermore, "an interrelation with Sami culture maintains the reindeer industry as a Sami industry" (ibid.). The problems that have emerged during the latest decades have had mainly external causes (Riseth 2003, p. 233), such as roads, mineral exploration, power stations, military exercises, tourism, and leisure activities (Helander 1993; Eira 2001, p. 43).

Reindeer herding is also a central tradition-based activity for **Swedish** and **Finnish Sami**, as well as for the Kola Sami. Thirteen percent of **Kola Sami** are connected to reindeer herding. Others work in construction, as drivers, in service sector, within family businesses, and within education and cultural sector. Today reindeer herding of the Kola Sami is mainly focused on meat production. Those who live in rural areas depend on reindeer herding, hunting, fishing, handicraft and gathering of mushroom and berries. Many herders have low wages and their overall influence is weak. The reindeer herding area covers 34 percent of **Sweden**. According to information in Johansson (1999) the amount of reindeer in Sweden was in 1997/98 228,000 (see also Jernsletten & Klokov 2002). The discussions and explanations are many regarding the condition of pasturelands and their carrying capacity. In Sweden, reindeer husbandry is reserved for Sami people. There are continuous conflicts between Swedish landowners and Sami herders.

One problem that Lars-Anders Baer (2002, p. 45) casts light on is that Swedish citizens have the right to unrestricted small-game hunting and fishing in Sami areas. These rights were earlier an intrinsic part of reindeer herding rights. The new law became a fact the same year than Sweden ratified the Convention on Biological Diversity (Lasko 2003) and established the Sami Parliament. After Sweden in 1993 abolished the traditional Sami hunting rights in Sami mountain regions, there have been many conflicts between the state and the Sami and between local authorities and Sami.

In **Finland** in 1987-1988, the amount of reindeer belonging to **Sami** husbandry was 81000 animals. In Finland, about 30 percent of the Sami population is in some way connected to reindeer herding. The Sami pasturelands are located within the Sami Home Area. Herders in Finland are experiencing similar problems as those in Norway and Sweden. In the Finnish side of the Sápmi, even though the 1990

Reindeer Herding Act should protect reindeer husbandry from competing activities, /…/ reindeer herding and other traditional Sami livelihoods regularly have to give way to competing interests (Åhren 2004, p.82). The main challenges are loss of pastures, loss of reindeer to predators, econonomic development based on meat production, and the unresolved problems of Sami land rights (Jernsletten & Klokov 2002, p.140). Pekka Aikio (2002, p.39) emphasizes that the connection between agriculture and reindeer husbandry should be disconnected regarding administration and management. Other challenging issues are: Finnish newspapers give a wrong picture about Sami herding activities, climate change factors are a threat, reindeer research can in some cases serve the state interests, recruitment of young people is endangered, women's position is weak (Hukkinen et al. 2002) and incomes from modern reindeer herding (meat production) are low (Jernsletten & Klokov 2002; Hukkinen et.al. 2002). Pekka Aikio (2002, p. 40) regards much of the discussions in Finland regarding land use by the Sami as "a scientific colonialism." In addition, knowledge-base within reindeer management should be Sami traditional knowledge and needs of herders combined with scientific facts (Hukkinen et.al 2002).

Reindeer herders´ knowledge: What does the reindeer herder know traditionally?

Directions, location, time:
- Tracks, for instance animal tracks on snow; signs from landscape, wind, sun and stars; non-linear time, right time to do things, time to make observations and observation-based plans

Flora:
- What flora, for what purposes and when to gather; food for reindeer, shoe-hay

Lands:
- Lands, landscapes, and pastures: biological and ecological conditions
- Land use patterns of different family-groups and districts, family land-use history
- Migration and movement through lands and over waters
- Management of lands and waters, management or resources
- Different ecosystems

Language:
- Place-names, special terms for reindeer and herding, terms regarding relatives, neighbours and partners
- Communicative patterns, stories, humour
- **Life in tent and cottages:**
- Outdoors living conditions and things
- Inside a tent or cottage
- Other animals than reindeer, birds, fish
- What animals, birds and fish, when and where

Reindeer:
- Contextual behaviour and "sociology" of reindeer and other animals
- Beautiful herd, how to accumulate beautiful/meaningful herd, single animals
- Biology, nutrition
- Earmarks and other markers of ownership
- Predators, insects

Sacred life - places, spirits, healing, items:
- Avoidance and nurturing of sacred places and locations of spirits
- Ceremonies, sacrifices, spirit contacts
- Healers and their items and activities
- Amulets to have

Seasons and flow of life in nature:
- Migration

- "Seasonal" material such as wood for handicraft, firewood, shoe-hay, roots to make baskets of, alder to colour reindeer skin or to smoke fish and meat with
- Fishing, hunting, gathering and herding activities of different seasons
- Slaughtering, preparation of meat and reindeer skin, production of cloths
- Tools, constructions, fences
- Teaching of children, teaching of dogs
- Wedding and other social activities, children in school

Social organization:

- Families, herding organization and their members (who is who in reindeer herding); their wealth, earmarks, pasture lands and pasture conditions,
- Plans and activities of other herders and herding districts
- Sami of other villages and regions, non-Sami "visitors"
- Sami customary rules, cultural values, religious beliefs, spirituality

Weather, climate:

- Local weather patterns and climate change indicators
- Overall activities in relation to weather: migrating, moving and herding

(By Elina Helander-Renvall, 2005)

Russia has about two thirds of the world's population of domesticated reindeer. They are herded on a territory of more than three million square kilometres on the tundra, forest-tundra, taiga and mountain areas. Indigenous peoples of Northern Russia have various traditions and wide experiences of reindeer herding in a diversity of landscapes. Many different peoples are engaged in reindeer husbandry, and 16 reindeer breeding peoples are in the official list of Indigenous small-numbered peoples of the North. Nenets, Komi, Saami, Evens, Evenks, Chukchi, Koriaks, Khants, and Dolgans have cultural traditions closely connected with reindeer breeding. The way of life and economy of these peoples depend mostly on reindeer. Reindeer husbandry in Russia is not an exclusive right for Indigenous peoples.

The number of domesticated reindeer has declined in Russia from almost 2.5 millions to 1.2 million. The situation in reindeer husbandry changed remarkably in the 1990's, when the formation of market economy and democratization began. According to the Arctic Council report (2002) this resulted in a significant reduction in the population size of domesticated reindeer, decline and decay of collective reindeer husbandry of the kolkhoz and sovkhoz types, and partial return to private ownership of reindeer herds. According to Dimitri Ottovits Horolje (2004), President of the Russian Association of Reindeer Herders Yamalo-Nenets Region, 50 percent of reindeers in Russia are found in the Yamal-Nenets autonomous district. From Yamal region comes also 90 percent of Russia's natural gas. The region has one of the largest untapped sources of natural gas and gas condensates (Forbes 1999).

The Nenets are the largest Indigenous people (41302 according to the 2002 census) among the so-called Small Peoples of the North, living in a huge area from Eastern parts of Kola Peninsula to the riverbanks of the Yenisei in Western Siberia. **Kolguev Island** lies in the Barents Sea and is part of Nenets autonomous district. Most of the population of the Island lives in the village of Bugrino situated in the Southern end of Kolguev. The total amount of population in Bugrino is 435 (2002). Most of the Bugrino population consists of Nenets. No population lives continually in the tundra, but the herders live temporarily in the huts built up in the tundra. Fishing has a very important role in the nutrition of the local people in Kolguev, but it is not commercial anymore.

The reindeer is important not only for its meat and for pelts, but because of its central position in the former way of living the nomadic lifestyle on the island. There are about 7,000 reindeer on the island of which a fourth is in private ownership. Herding has become a profession controlled by the local reindeer cooperative. The women have been taken outside the herding and nomadic practices. The reindeer pastures are getting smaller because of the oil extraction activities. The herders feel that their voice is not

heard in the land use decisions. Some conflicts take place between local people and oil workers concerning about rights. The hunting rights of oil workers are restricted. One of the most important environmental aspects is the way Nenets talk about the Kolguev Island and its places. It is hard to say what the position of this place knowledge in relation to land and resource use will be in the future. It is passed only to those moving in the tundra professionally.

The hunting of geese and ptarmigan has been and still is very important for all the inhabitants of Kolguev Island. The density of white-fronted goose and bean goose is very high with about 400,000 geese breeding in the island every year. The meat is very important source of nutrition, but it is also sold and exchanged for products and goods with mainland residents. There are also among others tundra swans, eiders, scaups, divers, long tailed ducks, rough-legged buzzards, falcons, owls and eagles in Kolguev. Furthermore, **t**here are both Arctic and red foxes on the island. There used to be also wolves in Kolguev, but during the wolf-killing campaigns in the Soviet times all the wolves were killed. Polar bears visit Kolguev yearly during the late winter. The polar bear used to be hunted earlier. Foxes are hunted for local use. The ringed and bearded seal are hunted in the shallow water on the Southern and Eastern coastlines and sandbanks. In addition, the Atlantic walrus can be seen in the warmer periods of the year. Seals are not sold anymore. The sea mammal hunting has, however, a big symbolic value as a historical source of livelihood especially for those Nenets families who have been living in the island for a longer time. (Text on Kolguev Island is from "Land Use and Nenets in the Kolguev Island – Russia" by Karin Lukin 2005.)

Experiences of co-management in Kamtšatka region and Koryak autonomous region – Russia: Kamtšatka Peninsula, a territory traditionally used by Indigenous peoples for river salmon fishing, has rich salmon resources, which attract foreign sport fishermen. After the collapse of the Soviet Union, the waters of Kamtšatka opened for access to foreign fishermen. Development of eco- and adventure tourism, including sport fishing, can create jobs and raise the level of income and welfare among the local people. Local people have their small-scale farms and continue hunting for subsistence. Today fishing is the basic economy in Kamtšatka (Yablochkov 2004).

Research of Kamtšatka fish stocks started in 1965 and the International Wild Salmon Centre (WSC) was founded in 1993. The Wild Salmon Center works with Moscow State University and the Committee of Nature Conservation of Koryak Autonomous Region for research and conservation of Kamtšatka steel head (*Parasalmo mykiss*). Kamtšatka steel head is an endangered salmon species that migrates to the ocean and back. The Wild Salmon Centre supports the scientific research on Kamtšatka salmon until the year 2015 with hopes to improve local economy. Today fishing of steelhead is done only for scientific purposes. However, it is difficult to control the implementation of laws and regulations in all parts of the territory, because the distances in the area are long. (Text on co-management from "Experiences of Co-management in Kamtšatka Region and Koryak Autonomous Regions" by Viktoria Šarahmatova 2005.)

In the **North American Arctic** many Indigenous people still lead subsistence or partial subsistence lifestyles where hunting, fishing, and plant gathering are daily activates or conducted during visits to the bush. In **Alaska,** the Federal government manages subsistence uses on Federal public lands and waters and the Secretaries of the Interior and Agriculture established the Federal Subsistence Management Program (see http://alaska.fws.gov/asm/index.htm) to provide proper subsistence management. There is a large dependency on wild resources both culturally and economically.

It has been found that large portions of the Indigenous population depend on traditional foods for their nutritional requirements in Alaska. The Subsistence Management Information Program provided by the United Fisherman of Alaska state that "subsistence hunting and fishing provide a large share of the food supply in rural Alaska. According to the state Division of Subsistence, about 44 million pounds of wild foods are taken annually by residents of rural Alaska, or about 375 pounds per person per year. This compares to 22 pounds per year harvested by Alaska's urban residents" (see the Subsistence Management Information Program at http://www.subsistmgtinfo.org/about.htm).

4.1.5 Climate change, global change, climate change observations

There is a lot of reporting on climate change in the Arctic. The reports show that climate change impacts are already a fact in the Arctic regions, and they require "urgent attention" by everyone (see for instance, Arktisk Miljö i Norden 1996; Global change in Europe's cold regions 1998; ACIA 2004; Helander & Mustonen 2004; Tennberg 2004). The Nordic countries in Europe regard climate change impacts and adaptation possibilities as quite manageable, in any case for the next decades (Tennberg 2004, pp. 36-40). A number of states hold doors open for their own national strategies but the costs and risks of climate change can be very high (ACIA pre-release 2005).

Climate change is severely influencing Indigenous ways and life. The potential impacts of climate change and environmental change on harvesting wildlife resources are of fundamental concern for the social and economic well-being, the health, and the cultural survival of Indigenous peoples throughout the Arctic (ACIA pre-release 2005). Indigenous peoples are exposed to climate change, to global changes and to local and regional political and economic condition in multiple ways: "It is important to contextualize climate change impacts with reference to other changes experienced by Arctic residents" (ACIA pre-release 2005). Helander (2004, p. 305) talks from **Sami** perspective: "People in the villages are worried as they face the global changes. Perhaps not so much about every single factor as such, such as some elements regarding the natural climate variation. However, the combination and the consequences of certain negative factors are scary."

The Arctic Indigenous environments and societies are very vulnerable, and Arctic regions will be among the most altered over the next few decades. The condition is already critical. The question is, which peoples, population groups and societies have the capacity and resources to deal with climate and global changes? Climate change factors are complicated and need attention from all corners of knowledge, monitoring and decision-making. In addition, local Indigenous peoples should become involved in monitoring activities. Participation of all concerned persons and organisations in decision-making is a prerequisite for environmental security in the Arctic.

Case study: Kola Peninsula, Sami climate change and species observations

Murmansk Oblast is located in Northwestern **Russia**, on the Kola Peninsula. The area covers 144,900 square kilometres and the population has been estimated at 1,109,000. The capital of the Oblast is the City of Murmansk, which has about 400,000 inhabitants. There are about 2,000 Sami on the Kola Peninsula. Vast natural resources exist in the area, as well as minerals, high technology and forestry. The Barents Sea areas have large natural oil and gas fields. Fishing industry plays a crucial part in the local economy. The Oblast has a high military concentration of nuclear weapons, mostly in the form of submarines, a legacy from the Cold War. Main economic and subsistence activities portraying these linkages are reindeer hunting, fishing, and berry picking.

Climatic change in the local weather has become a priority issue for the reindeer herders and others in Lovozero. The cycles of the seasons have defined the activities of the local people and climatic variation has been witnessed and has caused alarm locally. "In the past two, three years there has not been a permanent snow on the mountains. There used to be, but no more" (Vasily Lukov, 21st of April 2002, Reindeer breeder PTO-26, Lovozero). "Yes, it is very interesting. First it snows, and then it melts, like it would be summertime…. first there is a big snowfall, then it warms up and then it freezes" (Vladimir Philippov, 9th of June 2002, Reindeer-Herder of Brigade № 2, Reindeer state farm Tundra, Lovozero). The herders have utilized the waterways, such as many rivers and lakes of the Kola Peninsula in their transportation routes. The current changes have caused uncertainty and worries that the routes cannot be travelled on safely.

Large predators in addition to foxes, including arctic fox have been an essential part of the ecosystem in and near Lovozero. "In the olden times the arctic foxes could wander inside homes! Some years ago, during a time of rabies they jumped inside through the window! But now for example on a trip from the camp to the ocean shore there is no trace of them. But there are a lot of foxes" (Arkady Khodzinsky, 21st of April 2002, Reindeer-Herder of Brigade № 9, Reindeer's farm Tundra, Lovozero). "During times of butchering of reindeers wolverines and foxes come to the village. /…/ Wolves - yes, we have started to see them in the forests between our grazing grounds and Krasnoshelje" (Vasily Lukov, 21st April 2002, Reindeer breeder PTO-26, Lovozero). The number of wolverines has increased in the area. Wolves and wolverines kill reindeer. Regarding bear, Arkady Khodzinsky claims, "If I tell you the truth, they are not trouble for us. They live their own lives. Sometimes they can be a nuisance, but they are animals that have the right to live as well! But if they wander too close, we shoot them." The amount of insects has decreased according to local Kola Sami. Fishing in the local lakes, such as Lake Popovo and Lovozero is a crucial part of the local life. Changes have been witnessed as well there. There is less fish (Vasily Lukov, 21st April 2002, Reindeer breeder PTO-26, Lovozero). The most visible and urgent messages of changes relate back to the species of reindeer, which remains a key species of the community. Reindeer herders spend less time with the herds on the tundra. Mixing herds with the wild reindeers is a concern. A problem has been poaching that takes place here and there.

Kola Peninsula is one of the most important geopolitical and strategic military locations in the Russian Federation. Massive amounts of nuclear and non-nuclear military forces are stationed in the region. There is also a massive industrial presence. "We are trying to make the point that human beings should be able to live in peace in their own surroundings. The number of reindeer has decreased and good berry-picking and clean areas are less in number now. Even in Lake Seid, in the holy lake of the Sami Nation, they have made explosions and drilled core samples from the mountains" (Larissa Pavlovna Avdejeva, 9th June 2002, Director of the Sami Culture Center, Lovozero). (From "Kola Peninsula, Sami Climate Change and Species Observations" by Tero Mustonen & Sergey Zavalov 2005.)

In **Canada,** the Inuit are currently carrying out several initiatives to address climate change. The Canadian government and the Nunavut government have signed a Memorandum of Understanding for Cooperation on Addressing Climate Change in 2003 to work on reducing greenhouse gas emissions (MOU Climate Change, Nunavut 2003). The Inuit Tapiriit Kanatami (ITK), a national Inuit organization is carrying out several national level projects, for example:

- "Unikkaaqatigitt – Putting the Human Face on Climate Change," a publication that is a joint collaboration with several other organizations that presents climate change observations of 16 Inuit communities.
- Research on Inuit and climate change such as working on the ArcticNet project, which brings together scientists, managers, Inuit organizations, northern communities, federal and provincial agencies, and the private sector to study the impacts of climate change in the coastal Canadian Arctic.
- Member of the CCIARN – Costal Zone steering committee on sea-ice issues.
- Working on GHG emissions reductions though the Aboriginal and Northern Community Action Program. (Inuit Tapiriit Kanatami Environment Department 2004. Background Information on Arctic Climate Assessment. In the ITK CD-ROM: ACIA Information Package, November 2004.)

"When the Weather is Uggianaqtuq: Inuit Observations of Environmental Change" is a project documenting climate change in the **Canadian Arctic** that is an interactive, multi-media CD-ROM. This allows the Inuit from two communities in **Nunavut, Canada** to share their observations on recent environmental changes (Fox, 2003). "Uggianaqtuq" is a North Baffin Inuktitut word that means to behave

'unexpectedly', or 'in an unfamiliar way'. From the perspective of many hunters and Elders in the Arctic, the weather has been uggianaqtuq in recent years" (Fox, 2003). The CD-ROM provides a variety of text, photos, maps, video and music to provide examples of the changes the Inuit are experiencing in their environment and the impacts it is having on their culture and communities. For example the "Inuit in Clyde River have noticed a change in seals. Some seals have holes in their skin, white pustules on their meat, and skin rashes" (Fox, 2003).

Case study: Environmental Change in the North – North Slope, Alaska

Observations of environmental changes

Ocean and land changes: Whaling crewmembers uniformly pointed to large changes of recent years in the environment. By early August, shore ice had begun to form but was not yet fast. They noticed little pack ice in the ocean. Firm sea ice was some 100 to 300 miles distant from the coast. The great reduction in sea ice correspondingly increased the expanse of open water and the turbulence of waters -choppy seas, and very high waves when the wind blew. A common observation of whalers was: "The ice is further out, thinner; it is more dangerous with more open water." Most hunters noticed an increased amount of erosion to the banks of rivers and shores of lakes. Nearly all were conscious of changes to the continuous permafrost layer under the land surface, and they noticed slumping of land in recent years. Two hunters had to construct new ice cellars because old ones had begun to melt and no longer kept stored foods sufficiently cold. Also, several noted changes in vegetation, for example, willows were "marching north" and now were closer to the village.

Changes to rivers and lakes: About half of the respondents had observed a drop in the water level of rivers and lakes, and they mentioned seeing new islands and sandbars on rivers. A typical comment from fishers was: "The water is shallower; it is more difficult to go on the rivers now." In the last few years, most fishers commented that ice on rivers and lakes had been thinner, by several inches. This posed problems for snow machine travel on rivers in late fall and early spring. Also, river and lake ice was less hard. A few noticed changes in tides - which were stronger - and that the water was more turbid than previously.

Changes to weather and climate: With just a few exceptions, hunters and fishers noticed increased precipitation, more snow in the winter, in recent years freezing rain after freeze-up on occasions, and damper summers. Snow was wetter, unlike the dry snow of 20 years previously. Some noticed increased layering of snow. Most hunters, whalers, and fishers observed that the winds of recent years had changed. One respondent pictured it this way: "This summer, the wind circled; it kept turning around." Another said: "The wind blows in all directions. This is not like the 1970s and 1980s."

Changes in the conditions of species: Although whalers saw no changes in the number of whales migrating during the fall season, they noticed fewer *Oogruk* (bearded seals). They had seen skinny walruses, and more "hungry" polar bears.

Hunters noted that caribou herd sizes had been smaller in recent years, but the average weight of harvested caribou depended on the time of year not any exogenous change to herds. Most believed the incidence of sick caribou had increased, recounting one or two cases of caribou with swollen joints often with pus, deformed organs (smaller-than-average lungs or hearts), diseased livers, and discoloured meat.

In general, fishers believed that most fish species had declined in numbers, and that the fish they caught were skinnier than 20 years previously. They had to venture farther from the village in order to obtain a good fish harvest. And most noted one to three sickly fish among the 100s they caught.

A representative comment we heard was: “There are parasites in the fish, lesions in the muscles and ovaries of the broad whitefish and the Arctic Cisco. We didn’t see this before.” A particular concern was with the burbot, which many villagers believed has been contaminated by toxics in the aquatic system. To some hunters migratory flocks of birds appeared smaller than those of 20 years past, and one noted: “We see more birds with damaged livers and gall bladders. More of them are sick. Maybe they get sick on the way up, when they migrate.”

New and absent species: In the recollection of village residents, there were several new mammal species in the area, including: land otters, rabbits, porcupines, lynx, sheep, and bobcats. New fish species included the northern pike, a species of flounder, hooligans, silver and pink salmon, and Bering Sea Cisco. New bird species included robins, wrens, plovers, sandpipers, cranes, and Lapland longspears. New insect species included bumblebees, a form of greenish gnat, dragonflies, grasshoppers, wasps, and butterflies. Species increasing in incidence, included gulls, ravens, golden eagles, peregrine falcons, swans, pintail seagulls, seals (in rivers) and grizzly bears, many of which were drawn to industrial and village dump sites. A few species once prevalent in the village and vicinity now were rarely seen: ground squirrels, lemmings, ptarmigan, snow owls, arctic tern, and steller and spectacled eiders.

A final change observed by hunters was a change in the migration route of caribou. They believed that pipelines and industrial structures had blocked the traditional migration routes, confused the caribou, and made the herds less accessible to hunters.

Explanations of environmental changes
Without asking directly, hunters and fishers also mentioned what they thought had brought about the changes they had observed. Here are reports on the four factors mentioned most often: oil and gas exploration and development activities, climate change, toxic contamination, and natural cycles.

Oil and gas exploration and development: Uppermost factors in the minds of most people were the direct effects of oil and gas development. They noticed that:

- Migration routes of caribou changed because of oil company seismic and development activity, including small airplane and helicopter traffic over wide areas around the village. Hunters reported they had to travel farther to get game;
- Seismic testing for oil and gas deposits disturbed animals, fish, and vegetation;
- Ice roads and bridges disrupted animal and fish migration routes; reduced water in lakes and rivers that had over-wintering fish; and affected vegetation;
- Oil leaks and spills, spills of drilling mud and other contaminants entered the land and water systems; they endangered fish, bird, and animal species;
- Industrial sites attracted scavengers such as gulls, ravens, bears, and foxes; they preyed on fish and game used by residents for subsistence;
- Industrial sites released pollutants into the air, creating a localized haze in the air and causing breathing problems for people and potentially affecting fish and game. Ice and snow were “blacker, darker” in colour, especially near production sites along the arctic coast;
- Out-of-region hunters and fishers used the Haul Road to enter the area; they competed with Natives for limited fish and game.

Climate change: Most hunters and fishers thought the climate had gotten warmer, and this had more negative than positive effects:

- Thinning and melting of sea ice made fall whaling more hazardous;
- Melting of permafrost increased muddiness of fishing streams; it made cross-country travel by four-wheelers harder;
- Warming of ocean waters might have an impact on whales, walruses, and seals;
- Warming of river and lake waters was having negative effects on fish;
- Warming of land surfaces and air temperatures eased migration of invasive insect, plant, and bird pests;
- Thinning of river and lake ice made snow machine travel dangerous in winter; and later freeze-up, earlier break-up times disrupted fish and game migration patterns.

Toxic contamination: Hunters and fishers worried about toxic chemicals leaching into the water system from three sources:

- The Umiat site 50 miles upriver from the village (a formerly-used defence site or FUDS);
- The Puviksuk dump site within 10 miles of the village; and
- Metal debris including partially filled oil barrels left behind during seismic and other oil exploration work.

Residents feared that contaminants were already in the rivers and that high mercury levels were making some fish unhealthy. Also, they worried that toxic substances in waters might be causing an increase of contamination in animals they hunted, particularly caribou.

Natural cycles: Hunters and fishers also noticed natural changes - of rivers, landforms, and climate - and the cyclical patterns of increase and decline in fish and game populations. They carefully contrasted these natural changes with the recent changes to the environment from oil and gas development, from climate warming, and from toxic contamination.

Value of traditional ecological knowledge
Subsistence hunters, fishers, and gatherers had broad experience of physical conditions in a 100-mile radius of their village. They travelled throughout the year, during different weather and climate situations. Because their success in subsistence depends on accumulated knowledge of the environment, they have developed keen visual skills and finely honed memories of places and species. No scientific monitoring system in the Arctic compares with the cumulative observational record of hunters, fishers, and gatherers in the North Slope area we investigated. One concern is that the ecological knowledge of Elders, while passed down to younger generations through joint experience in hunting and fishing, has not been systematically preserved through oral histories.

Based on their observations, subsistence users adjusted to the environmental changes confronted. They altered times and places for hunting and fishing, the gear they used, and how they handled unhealthy fish and game. They had rich knowledge of changes to local conditions.

Village residents make use of TEK for survival purposes. Regionally, the knowledge of subsistence whales, hunters, and fishers is in the process of becoming institutionalized. For example, the Alaska Eskimo Whaling Commission (AEWC) uses sightings of bowhead whales to defend its quota. In a successful partnership with the oil industry, AEWC combines TEK with scientific monitoring to establish whaling season times and catch limits. The regional government - the North Slope Borough (NSB) - increasingly uses TEK for both planning and wildlife management purposes. For instance, based on the experience of hunters and fishers, the NSB seeks to add stipulations to oil/gas company project design plans and conditional use permits.

The myriad studies being conducted by physical scientists in the Arctic are less likely to

incorporate TEK, and this observation also applies to state and federal governments in their planning processes and land use policies, regulations, and laws. This is short-sighted for TEK can provide evidence of the validity of many of the conclusions of these studies, and perhaps more importantly, it can provide direction for some of those same studies.

Many western scientists dispute the value of TEK, calling it anecdotal and unreliable. These same scientists may not understand the processes through which TEK is collected. Both state and federal governments, which have primary regulatory authority, to the present have been reluctant to give credence to TEK without scientific confirmation. Available scientific information is incomplete and uncertain respecting the diverse species and ecosystems of the Alaska North Slope, and to omit consideration of TEK seriously impairs government attempts to protect the environment of the region. Also, existing biases toward TEK are a large obstacle to enhancing TEK preservation and further development.

Although the village visited has fewer than 500 residents, we were impressed that so many organizations were observing change to the environment. These include the Restoration Advisory Board (RAB), with local, borough, state, and federal representatives; the Subsistence Oversight Panel of the village corporation; the Native village; and even the city council. Altogether, these different organizations draw upon the vast knowledge of experienced hunters, fishers, and gatherers. There are many sources of information about environmental change and many organizations to work at drawing state and federal attention to local problems.

Despite the number and variety of organizations observing change and the fact that some individuals in the North Slope community served on several of these groups, no centralized mechanism provided direction or a unified framework for those observations. Moreover, no single organization has the capability to enhance the village's ability to develop community versus individual strategies to adapt to and mitigate environmental change.

A new effort supported by the Arctic Council might be of value to the village visited. This is the Arctic Monitoring and Assessment Program (AMAP), which help arctic communities develop a capacity to monitor environmental change over time. It forms a network of villages facing similar problems, which is helpful in finding adaptation and mitigation strategies. The Utqiagvik Iñupiat Corporation's Science Center (located in Barrow) may be another such resource to assist the community in developing that capacity. (From "Environmental Change in the North: Evaluation Using Local Cultural Perceptions" by Jerry McBeath & Carl Shepro 2005.)

4.1.6 Arctic issues

There are several organizations that operate at the international level addressing Arctic issues. The Arctic Council is an international forum created to advance circumpolar cooperation. The Arctic Council is comprised of the eight Arctic States: Canada, Denmark, Iceland, Norway, Sweden, Finland, The Russian Federation, and the United States. Its mandate is to protect the Arctic environment and promote the economic, social and cultural well-being of northern peoples. Six international Indigenous peoples' organizations are involved as Permanent Participants: the Inuit Circumpolar Conference (ICC), the Saami Council, the Russian Association of Indigenous Peoples of the North (RAIPON), the Aleut International Association (AIA), the Arctic Athabascan Council (AAC) and the Gwich'in Council International (GCI). The Arctic Council's Indigenous Peoples' Secretariat helps Arctic Indigenous organizations, and the Permanent Participants, work through the Arctic Council towards the common goal of addressing Arctic issues that are of importance for Indigenous people. The Arctic Council has made use of Indigenous knowledge and one of the Arctic Council's Working Groups sponsored TEK studies and projects (Nowlan, 2001). These projects have conducted such work as "collecting Indigenous knowledge on beluga whales in Alaska, creating an Indigenous Peoples' Knowledge database, a study on ice edge

ecosystem and Indigenous knowledge, and developing ethical principals for research" (Nowlan, 2001).

A new comprehensive network, the Arctic Residents Network of Socio-Economic Assessment and Education for Sustainable Development (ARN) has been proposed and was supported by the Arctic Council meeting in May 2004. Tatjana Vlassova (2005), the leader of the Arctic Sustainability Project of the Russian Academy of Sciences and coordinator of Arctic Residents' Network, writes: "The aim of ARN is to broaden the participation of Arctic residents (Indigenous and non-Indigenous) in the assessment of socio-environmental situation and changes that are necessary for the Sustainable Development Plans elaboration through local to circumpolar levels. Partnership relations and cooperation between local authorities, regional and federal governments, different cultural, social and professional groups of Arctic residents for conflict resolution and sustainable development of natural and land resources will be developed. The ARN will help to establish better understanding and cooperation between the non-Indigenous and Indigenous population in the regions of the Arctic." (ARN text from "The Use and Maintenance of Traditional Knowledge, Innovations and Practices of Local and Indigenous Peoples in the Russian Arctic" by Tatjana Vlassova 2005.)

In the circumpolar North, there is a strong movement to ensure that there is access to higher education and research, for the people in the North, which address issues affecting the Arctic. The organization that promotes this is "the University of the Arctic (UArctic), [which], is a cooperative network of universities, colleges, and other organizations committed to higher education and research in the North. Members share resources, facilities, and expertise to build postsecondary education programs that are relevant and accessible to northern students. [The] overall goal is to create a strong, sustainable circumpolar region by empowering northerners and northern communities through education and shared knowledge" (UArctic Strategic Plan 2005).

The University of the Arctic and its programs "function as spaces for institutional processes to further the political and environmental work of the Arctic Council" (AHDR, 2004). The "UArctic recognizes the integral role of Indigenous peoples in northern education and seeks to engage their perspectives" (UArctic Strategic Plan 2005). Members include Indigenous organizations such as the Arctic Athabaskan Council, Gwich'in Council International, and the Russian Association of Indigenous Peoples of the North (RAIPON). There is an Indigenous Peoples Issues Committee, which promotes Indigenous input into the UArctic and its programs. The UArctic is seen by many Indigenous organizations as an institution where they can influence and participate in northern research and education (AHDR, 2004). The Indigenous organizations and institutions have the opportunity to develop and influence curriculum and the possibility for traditional knowledge holders to be included as teachers (AHDR, 2004).

The Nordic Council is another organization that addresses Arctic issues. The Council is a cooperative organization for the legislatures of the Nordic countries Denmark, Finland, Iceland, Norway, Sweden and the autonomous territories of the Faroe Islands, Greenland, and Åland. It issues recommendations to the Nordic Council of Ministers and the individual governments on many matters such as improving Nordic co-operation, culture, environment, and sustainable social and economic development. The Nordic Council and its state authorities have recognized the Sami Council as a legitimate representative for the Sami. The Nordic Council gave the Sami observer status in 1994 with a right to speak during the general debate in council sessions. The Sami Council has had an important role in promoting the economic, social, cultural and educational interests of the Sami in Norway, Sweden, Finland and Russia (see the Nordic Council website at www.norden.org).

4.1.7 Knowledge versus practice: State of retention of traditional knowledge concerning practices relevant to the customary management, conservation and sustainable use of biological diversity that are no longer maintained or are at risk of disappearing

Some general observations are very clear when discussing the things that are disappearing. In all areas,

the overall impression is that knowledge about biodiversity and practices supporting biodiversity is declining. One can find much information written in modern media, but the practice in many areas in concrete everyday situations is lacking. The picture is mosaic-like and complicated, filled with many contradictions and leaving space for continued oppression and negligence of Indigenous peoples and their biodiversity-related knowledge base. Some examples are given below. Those people who are actively practicing hunting, fishing, gathering, and other similar activities normally retain overall know-how about nature and they know a lot about the use of the harvested species.

There may be success in one area, but at the same time, there are failures and losses in other areas of life. In **Sweden** and **Finland** there is investigation going on how to ratify the ILO convention. "Simultaneously, exploitation of **Sami** ground is taking place and several legal processes are going on, aiming at eliminating Sami rights" (Sikku 2004). An example regarding the situation is that some Sami young people are eager to learn their mother tongue, but they do not have the possibilities to learn traditional practices such as making traditional food or slaughtering reindeer. The lack of interest is in many cases developed in schools or when young people see how problematic it is to conduct traditional practices. Certain types of knowledge are losing ground among all age groups of the Sami, such as the use of traditional medicine. Documentation and modern teaching material is needed. Sören Stachie Nielsen (1999) gives an example from **Greenlandic Inuit** regarding seal hunting: "Living as a hunter nowadays must entail problems, especially as it seems as if life as a hunter is on the wane. For several reasons he has difficulties selling his product…" (pp. 253-254). Nielsen continues (p. 254): "As the problems of living as a hunter increase, the desire to continue the way of living of the Elders with their knowledge seems to fall away among the young generation in the settlements."

Many **Indigenous languages** are dying or endangered. Children and young people in many areas do not have possibilities to learn their native tongue in natural environment as daily means of communication. Oftentimes, there are not enough resources to continue with programs that support the linguistic skills of children and young people or there are not enough native students. IUCN points out in its Indigenous knowledge program that it is not a coincidence that areas of linguistic and ethnic diversity are also areas rich in biodiversity, and recognizes the connection between traditional ecological knowledge and language. Indigenous languages are part of the Indigenous knowledge (Helander 1999a) and these languages "come from the land and the relationship people foster and nurture to the essential forces of nature" (Simpson 2004, p. 27). Languages have to be maintained and preserved in their natural contexts, through *in-situ* preservation (Posey 1999) and through other maintenance strategies. The Sami words regarding seal have been lost in Northern Norway among the Sea Sami "as seal hunting has lost its significance as a form of subsistence in Sami areas" (Jernsletten 1997, p. 97). Thus, there is a connection between TEK and practices.

Traditional culture and language of the **Skolt Sami in Finland** is endangered. According to Pelto & Mosnikoff (1978, p. 196), by 1970 many Skolt cultural features (traditional dances, costume, weaving, singing and so forth) were largely gone. Since the 1970s, there has been a certain cultural revival though.

Marja Sinikka Semenoja (1995, p. 84) asks: "Is there a more sad person than she who has lost contact with her own language and culture, who has learnt to relate to her own people with resignation and despise", while knowing that regardless of her attempts to hide and deny her Sami background she is a member of a disdained minority group."

Furthermore, as Russell Barsh (1999) points out, Indigenous knowledge lacks protection by law in most regions. The international and national communities need to "agree that the Indigenous peoples are the true owners of their ecological knowledge" (Barsh 1999, p. 76). In addition, the traditional practices and environments where the native culture and languages are cherished they are threatened, as is the biodiversity of these environments. To protect these, Indigenous land issues and self-governance usually

come up when discussing CBD, 8(j). For example, a reindeer herder and politician from **Finnish Sápmi**, Ilmari Tapiola explains when intervened about global and climate change issues: "We should be able to decide on our waters and lands in some way. /…/ To my mind there should be Sami lands given to Sami people for governing within the national borders. I see that as the only choice" (Helander & Mustonen 2004, p. 301; see also Oskal 2002 and Wessendorf 2005).

Sami ptarmigan trapping was still in 1950s and even 1960s one of the most important subsistence activities during the winter season. These days there are very few persons who include trapping in their economic subsistence mode. Very few young boys practice trapping now (Helander 1999). Also knowledge in **traditional fishing methods** of the Deatnu/Teno River in the north is about to disappear as a practiced know-how. Methods and terminology are documented through filming and texts.

4.1.8 Assessing the feasibility of using the existing traditional knowledge to maintain practices relevant for the management, conservation and sustainable use of biological diversity

It is obvious that in order to make it possible for the Indigenous peoples themselves to safeguard their knowledge and practice, there is a need to strengthen their rights and self-governance. The states concerned need to fulfil their obligations under international agreements and national duties. "International law and prior agreements include legal standards that are arguably more favourable to Indigenous peoples than the CBD itself" (Barsh & Henderson 2003, p. 55). Indigenous peoples have their own rules regarding the interaction with nature and these customary rules must be honoured when designing biodiversity-related legislation and measures. One problem is that in some areas, for instance in Russia, there are suitable laws but the implementation of them does not function properly. Most Indigenous peoples are highly dependent on the states and their laws, authorities, and measures and financial support in implementation of the CBD, article 8(j). Indigenous groups themselves need to address biodiversity issues as a conscious policy and program. Such programs need to get space in national policies. Now, many national plans are tailored to take care of the biodiversity from the vantage point of the majority population.

In addition, it is necessary to protect Indigenous areas from exploitation that hinders Indigenous groups from learning and using their traditional knowledge and practices in a sustainable way (Henriksen 2002). The connection between self-determination and implementation of traditional ecological knowledge become important issues to discuss in the light of biodiversity management. Home Rule is a "process rather than an end" (Caulfield 2000, p. 180). All concerned actors of biodiversity implementation - Indigenous as well as non-Indigenous - need time to make action plans and find funding. The different stakeholders and knowledge holders need to cooperate**.**

According to Circumpolar Sustainable Development (1994, p. 21), **Greenland** has a long tradition of sustainable development of renewable resources. One project to enhance sustainable use of living resources is the spreading of musk oxen in Greenland (ibid). Muskoxen occur naturally in Northeast and East Greenland (The Biodiversity of Greenland, 2003, p. 108). This project has relocated or transplanted 27 animals from the east coast between 1962 and 1965 to Kangerlussuaq in the central west coast. In 1993, this population has increased to 4000 individuals. From this area, the musk oxen have been able to spread to other suitable areas. The Greenland Home Rule has cooperated with the Organization of Hunters and Fishermen in Greenland. This cooperation has proved to be a good one leading to certain success in resource management. Natural sciences dominate the research field regarding biodiversity management in Greenland (Anderson & Nuttall 2004; The Biodiversity of Greenland 2003).

In **Russia**, the UNEP/Grid-Arendal project "Local Health and Environmental Reporting by Indigenous Peoples in the Russian Arctic" (2002-2003) together with the "Arctic Sustainability Project of Russian Academy of Sciences" have done research on the environmental impacts on the health of the Indigenous peoples and state of their traditional knowledge about the environment. Four hundred and ninety-two

Indigenous peoples from ten settlements were interviewed. On the question, "Where do you use the traditional knowledge?" 46 percent of Indigenous people answered that they use TK in traditional land use practices. Vlassova (2005) from Russian Academy of Sciences writes that, according to the results, "Knowledge of functional ecosystems and any threats towards them is of primary importance to practice traditional activities in sustainable way." According to projects results, 15 percent of respondents use TK in children upbringing and home education, which shows "the high educational status of TK implementation." TK is also used in curing by traditional means, and in cooking traditional ethnic food. About 5 percent answered that they use traditional knowledge everywhere. Vlassova (2005) states that, the vast territory of the Russian Arctic could be observed by Indigenous reindeer herders, hunters, fisheries, gatherers, and craftsmen. Changes in the environment, for example air and water pollution, flooding, erosion, permafrost thawing, changes in snow cover, drought, invasion of new species of flora and fauna, and disappearance of those which used to inhabit these regions, forest areas expansion or retreat, fires, insect and pest activity, vulnerability of human/nature systems, etc., could be observed and assessed by the Indigenous peoples. (Text on Russia from "The Use and Maintenance of Traditional Knowledge, Innovations and Practices of Local and Indigenous Peoples in the Russian Arctic" by Tatiana Vlassova 2005.)

Sea Sami in Vestertana, Northern Norway: After World War II, the material development of northern Norway had begun. Sea Sami culture did not meet the criteria imposed by Norwegian society and was considered by many non-Sami to be outdated and reactionary. The Sea Sami among themselves began to feel that they were excluded from the spheres of interest of both the Sami at large and Norwegian society. The local fishing culture in Vestertana (in Deatnu/Tana Fjord) still has many of its special features intact. Fishing is mainly practised according to old models, i.e. with small boats, little mobility, as well as with short distances to the fishing grounds. This has been identity-creating for the Sea Sami communities. In his description of the coastal and fjordal areas Ragnar Nilsen (1988) emphasises the importance of 'fjord rationality' in the fjord area: it is rational to accept a social situation which includes a low income but which, at the same time, maintains traditional subsistence activities and develops them into new combinations. Fjord rationality also rejects the pursuit of bigger catches and competition with other fishermen as means of raising one's living standard. Fjord fishers use selective gear such as nets and fishing line, picking out only mature fish, which guarantees that fish live long enough to maintain reproduction. Selective fishing to a restricted degree in the inner parts of the fjord represents an activity, which is long-term, economic, and conducive to sustainability.

In spite of the resource saving by Sea Sami fishers, they have encountered great problems in getting official support from Norwegian society for their way of life (Helander 2001). The daily lives of those who live in the fjord area are influenced by external knowledge and decisions taken elsewhere. The Norwegian state has decided to investigate the sea fisheries (Helander 2002).

4.1.9 Gender and traditional knowledge in the circumpolar North

It is generally understood that traditional knowledge refers to both a dynamic and flexible body of information about the land, its resources and systems, which are transmitted over time. Gender is one of the most critical of the factors affecting the nature of traditional knowledge (Simpson, 1994; Grenier, 1998). Women both historically and currently are primarily responsible for food preparation and distribution and for ensuring the short and long-term health of the family and community. Indigenous women are, therefore, highly knowledgeable about biodiversity as it relates to plants, wildlife and other natural resources that may have nutritional or medicinal value (Fernandez, 1994; Zweifel, 1997). Women have also been responsible for developing and maintaining forms of cultural expression such as textiles, basketry and other forms of arts and crafts. In many Indigenous communities, women are primarily involved in transmitting traditional knowledge including sharing herbal remedies, teaching traditional design patterns on clothing or preparing fish in a certain manner (Quiroz, 1994; UN World Intellectual Property Organization, 2005).

Why does the literature on traditional knowledge rarely address gender?
Despite the fact that traditional knowledge (TK) has existed for millennia, research and scientific literature on TK has only proliferated since the 1990's. Given its relative youth, it is perhaps understandable that there are many gaps in this literature that have yet to be addressed. One of the most glaring gaps in the Western scientific literature on TK is its failure to address gender (Fernandez, 1994; Grenier, 1998). Although the Convention on Biological Diversity and other international protocols (for example see Agenda 21 Chapters 24, 26, 1992 and the Draft Platform for Action Section 74, 1994) have officially recognized women's vital roles in the conservation and use of natural resources, this is not reflected in either the theoretical or the empirical literature (Quiroz, 1994; Zweifel, 1997; Grenier, 1998).

The number of women who participate actively in the public sphere and the degree to which women's contributions are valued and supported varies significantly according to the group and the community. In many Indigenous communities, there is little formal delineation between women's and men's roles and gender is an issue that is rarely discussed in relation to biodiversity and the management of natural resources. As with most Western scientific literature, studies include both women's and men's voices but fail to acknowledge that gender is a significant factor in the development and maintenance of traditional knowledge.

While one or several authors write Western scientific papers, Indigenous TK studies are designed to reflect diverse community perspectives. These studies usually involve Western scientists as well but the emphasis is placed on listening to the community (McDonald et al., 1997; Thorpe et al., 2001). In Nunavut, Canada, the community with the financial support and involvement of the territorial and federal governments and the regional wildlife organization usually initiates Inuit traditional knowledge studies. However, it is usually board members of local community groups known as Hunters and Trappers Organizations who are most active in these TK studies and who guide the course of the work and determine its priorities. As outlined in Kafarowski (2005a), few Inuit women in Nunavut are elected as board members of Hunters and Trappers Organizations. This results in critical natural resource decisions and policies that are made without the substantive input of women. Zweifel (1997) states, the acknowledgement of women's traditional knowledge leads to the conclusion that women must assume a greater role in determining the direction and priorities of research programs. Appleton and Hill (1994) assert that: "Little critical attention is given to the value of women's knowledge in relation to identified problems and available resources in the wider environment, or to the integrity of women's knowledge as a sphere of knowledge in its own right.

What is the nature of women's traditional knowledge?
As Kenny (2004) and others have pointed out, Indigenous women hold a special responsibility for nurturing Mother Earth and caring for her resources. Women also have a primary role in ensuring that traditional knowledge and cultural values are transferred to the next generation. If this knowledge is not recognized and maintained, it will not be passed on. According to Quiroz (1994): "Women's relation with and perception of their environment tends to be comprehensive and multidimensional whereas men's knowledge … tends to be one-dimensional, focusing on narrow areas." Women's ability to identify and examine all aspects of an issue rather than focusing on one element in particular is critical when facing the complex ramifications of environmental change.

Recent work conducted by Robinson, Morrow and Northway (2006, forthcoming) investigates women's knowledge of changes in humpback whitefish in a subsistence-based economy in Alaska, United States. The authors determined that roles in the fisheries are based on gender as women mainly prepare the fish and men catch the fish and drive the boats. In this study, women and men have varying experiences and knowledge of the fishery and the ecosystem upon which it is based. For example, women are able to judge whether a particular season or year has resulted in an increased or an unusual parasite load. As Robinson, Morrow and Northway state (2006): "While men also see parasites, talk about them and voice

concerns, women provided more detailed descriptions of seasonal and long-term differences in parasites." Women also identify that certain whitefish have stomachs full of sand rather than food at certain times of the year and this has lead to a local belief that increased siltation covers the crustaceans which comprise the primary food resource for the fish.

How do women connect their knowledge of the land to social/environmental justice?
Women's knowledge and understanding of the land is not confined to harbouring basic information about natural resources or being aware of changes and fluctuations in these resources over time. In many cases, women not only possess traditional knowledge and transmit it to future generations. They also discern tangible links between TK and the maintenance of cultural and spiritual values. As recognized in Section 8 of the Declaration from the Sami Parliamentarian Conference (2005), "Sami women are bearers of fundamental values and know-how that must be specially emphasized." Globally, Indigenous women have often assumed significant roles when dealing with issues of environmental justice. This has also been the case in the circumpolar North including the conflict over the building of the Alta dam in northern Norway in the late 1970's and early 1980's when Sami women and men opposed the plans of the Norwegian government to dam the Alta river.

In early 2001, the municipality of Ohcejohka/Utsjoki in northern Finland announced plans to bottle and sell water from Suttesája- a natural spring sacred to the Sami. Recognized as a heritage site of historical and cultural significance under the Finnish *Heritage Act*, Suttesája is included in the network of European protected areas known as Natura and is the largest natural spring in Europe. It has also been revered as a traditional sacred site for generations and, according to tradition, belongs to an ancient sacred Sami region known as Baseskáidi. Government plans to commodify water from this spring, violated rights of the Sami. As documented by Heimo and Kuokkanen (2003), a group of local Sami (predominantly women) challenged the plans of the municipality in court and asserted Sami rights to this resource.

"For the Sami, Suttesája has been a site of cleansing and healing for generations. Near the spring, there is also an ancient sacrificial site where the local Sami have expressed their respect and gratitude to the Sami gods and spirits governing the natural world. Generally, when something is sacred, whether it is an object, site or person, then it must be placed apart from everyday things or places so that its special significance can be recognized, and rules regarding it obeyed. Clearly, any commercial activities would interfere in Suttesája's sacredness" (Kuokkanen, 2002, p. 2).

Despite concerted attempts to marginalize their efforts on a variety of levels (both because they were women and because they were Sami), this small group of women drew international attention to this issue and succeeded in at least temporarily halting this project.

According to Zweifel (1997): "Acknowledging the Indigenous knowledge of women would be an important step towards new paradigms on sustainable resource use for development and research…Not only is there a need to understand and revalidate women's roles as custodians of biodiversity, this also raises policy issues related to the appropriation of women's knowledge of, and control over, genetic resources" (p. 4). Indigenous women and men hold distinct traditional knowledge. Recognizing this distinctiveness is particularly critical given the continuing rate of environmental change in the circumpolar North. (From "Gender and Traditional Knowledge in the Circumpolar North" by Joanna Kafarowski 2005.)

4.2 Identification and assessment of measures and initiatives to protect, promote, and facilitate the use of traditional knowledge

4.2.1 International law, international organizations and institutions

There are several international organizations that are working on issues regarding Indigenous peoples and

traditional knowledge. This section will highlight some of these organizations and the work they are currently undertaking.

The Arctic Council's Indigenous Peoples' Secretariat (IPS) focuses on issues of importance to Arctic Indigenous peoples such as traditional knowledge, climate change, persistent toxic substances, sustainable development, and capacity building. The Secretariat developed a comprehensive report on traditional knowledge prepared in 1999. Two projects of the Arctic Council affect Indigenous people and include Indigenous knowledge as an essential part of the study. The first project is with the International Arctic Science Committee (IASC) entitled the "Impacts of a Warming Arctic: Arctic Climate Impact Assessment" (ACIA) report, which assessed the present and future impact of climate change in the Arctic and made recommendations of action to the Arctic Council (ACIA, 2004 and IPS). The second project is the "Arctic Human Development Report" (AHDR) that assessed sustainable development and human well-being in the Arctic region. The report used a variety of indicators including environment, economics, health, governance, and culture (AHDR, 2004 and IPS). These reports show that scientists are realizing that traditional knowledge has an important role in helping to explain the environment and changes that are occurring.

The Alaska-Chukotka Development Project is a three-year project sponsored by the U.S. Agency for International Development with the University of Alaska Anchorage's Institute for Social and Economic Research. The project is to assist the Indigenous people in Chukotka, Russia. The project has three areas of focus, Civil Society, Economic Development, and Humanitarian Aid. With the collaboration with the Alaska Eskimo Whaling Commission, one project works with Chukotka Indigenous organizations to strengthen their traditional subsistence way of life and movement toward self-sufficiency. The three organizations are the Yupik Eskimo Society, the Naukan Production Cooperative and the Association of Traditional Marine Mammal Hunters of Chukotka.

A second project is to assist the Chukotka Union of Reindeer Herders in setting up an office in order to communicate with its members and in becoming effective resource managers. Using the knowledge of local reindeer herders the project is developing a system for better monitoring of the reindeer.
(From the Alaska-Chukotka Development Project website, University of Alaska Anchorage at http://www.chukotka.uaa.alaska.edu.)

The World Intellectual Property Organization (WIPO) is a United Nations agency that promotes the use and protection of intellectual property. WIPO works with other international organizations and provides a forum for international policy debate concerning the interplay between intellectual property and traditional knowledge, genetic resources, traditional cultural expressions (folklore). It is developing draft legal mechanisms and a range of practical tools aimed at enhancing the intellectual property interests of the holders of such knowledge, resources and expressions. There are currently two draft provisions, one for the protection of traditional cultural expressions/folklore and one for the protection of traditional knowledge (WIPO and WIPO Booklet's, "Intellectual Property and Traditional Knowledge" and "Intellectual Property and Traditional Cultural Expressions/Folklore").

The International Work Group for Indigenous Affairs (IWGIA) is an organization that works at the local, regional and international levels to further the understanding, knowledge, and involvement of Indigenous peoples. It does this though publications, human rights work, networking, conferences, campaigns and projects to improve Indigenous peoples relations with their nation's governments and to influence the global economic and political forces that affect their lives (see the IWGIA website at www.iwgia.org).

University of the Arctic Indigenous Thematic Network
Currently under development is the UArctic Indigenous Thematic Network (ITN) on Community-based Natural Resource Co-management. The ITN plans to increase the articulation and sharing of Indigenous

knowledge and scholarship in natural resource management and to develop the capacity building for Indigenous communities in natural resource co-management areas. ITN will focus on the areas of research cooperation, knowledge sharing, curriculum development, and a joint education program in natural resource management. The organizations that make up the core-working group are the Sami University College, RAIPON, and Wilp Wilxo'oskwhl Nisga'a. (Presentation at the 8th annual meeting of the Council of the University of the Arctic in Oulu, Finland, May 19 - 21, 2005.)

4.2.2 Legislative measures including policy and Indigenous organizations

The Home Rule Government has jurisdiction over renewable resources in **Greenland**. Foreign affairs and military defence are the responsibility of Denmark. In **Norway,** the Sami people are recognized as Indigenous people. The responsibilities of the Norwegian state towards the Sami are based on the *Sami Act* (*Sameloven*) 1987, and the Constitution Article 110A, 1988. Section 110A reads: "It is the duty of the State authorities to ensure that conditions exist within which the Sami people can secure and develop their own language, culture and community life."

In 1997, the decision was made by the Norwegian Stortinget to establish a **Sami Parliament** the Sametinget. The first elections were in 1989 and since then the Sami in Norway have been able to negotiate with the state concerning their issues. The Sami Parliament can, on its own initiative, raise matters and issue statements with regard to all matters within its scope of activity. The law regarding the Sametinget and other legal issues (*Sameloven*) from 1987 also contains legal protection for the Sami language (§ 1-5). The *Sami Language Act* gives certain rights to use Sami as official language in the state administration and juridical contexts in certain linguistic areas.

Norway has also ratified the ILO-convention and has adopted a new Act "*Finnmarksloven*" which deals with the land rights of the Sami in the Finnmark County in the north. The Sami Parliament together with Finnmark County is the owner of lands of Finnmark (Innst.O.nr.80 (2004-2005), section 1; www.stortinget.no). The central aim of this law is to manage the natural resources of Finnmark in a balanced and sustainable way to benefit the Sami culture and heritage, reindeer husbandry, economic life in general as well as other inhabitants of Finnmark (Innst.O.nr.80 (2004-2005), section 5.2; www.stortinget.no). The area concerned includes about 95 percent of Finnmark County (45 000km²).

Norway is also preparing a law concerning the maintenance of nature, landscape and biological diversity (NOU 2004:28). In this context there is an analysis made on the challenges relating to Indigenous communities (NOU 2004:28). The aim of the law is to guarantee through protection and sustainable use, that nature with its biological, landscape-related and geological diversity and ecological processes will be safeguarded. The Sami Parliament participated in the reference group for the Committee reviewing the biodiversity legislation in Norway (CBD Third National Report - Norway).

In **Finland,** Sami are formally recognized as Indigenous people. It is noted however that "Finland still treats the Sami people as a national linguistic minority rather than an Indigenous people and ignores the special relationship the Sami people enjoys with its surrounding environment and natural resources, livelihoods, legal systems and traditions, giving the false impression that legal protection of linguistic rights alone is sufficient for the Saami people to be able to maintain its culture." (IWGIA 2005; see also Sami Parliament Report 2003). The Finnish state has formally acknowledged its acceptance of ILO-convention No. 169 in principle (Lewis 1998, p. 105) and is investigating possibilities to ratify the ILO-convention. Finland is also investigating Sami land rights issues.

According to §14:3 of the *Constitution Act* of Finland (969/1995) the Sami, as an Indigenous people, have the right to maintain and develop their own languages and culture. There is also a *Sami Language Act* (1086/2003), which guarantees the right of Sami to maintain and develop their own language and culture and to use their own language in court and before authorities. In Finland, in January 1996 an amendment

to the *Constitution Act* (973/1995), (§51 a), stating that the Sami shall be guaranteed cultural autonomy in respect of their language and culture within the Sami Home Area entered into force. The Sami Parliament was given a higher status.

Sweden has declared in 1990 its intention not to ratify the ILO-Convention. However, in SOU 1999:25 (Samerna-ett ursprungsfolk i Sverige) the issue has been analyzed. Sweden has not recognized Sami as Indigenous people in a formal sense. In Sweden, **Sami** legislation has been exclusively a matter of reindeer herding (Eriksson 1997, p. 120). According to Mörkenstam (2002, p. 132), "the notion of Saami as reindeer herders constitutes built-in limitations for Saami policy." Sami culture is made equal to nomadic way of life and legislation supports this idea (ibid.). Therefore, "demands of measures not related to reindeer herding are still pressed out of the discourse" (ibid.). The Swedish Parliament approved the *Sami Act* in 1992. The *Sami Act* provides for establishment of the Sami Parliament and its mandate. The Sami Parliament in Sweden has a more concretely formulated mandate than the Sami Parliaments of Norway and Finland. It deals "with questions that are connected with the Saami Culture in Sweden" and it is "a state authority" (John B. Henriksen 1999, p. 43).

In **North America** there are many legislative measures and policies that affect Indigenous peoples and traditional knowledge. In **Canada** there have been several self-government agreements such as the 1993 *Nunavut Act* and the *Nunavut Land Claims Agreement Act* (NLCA) resulted in the creation of the new territory of Nunavut in 1999 and is the largest Aboriginal land claim settlement in Canadian history.

The *Labrador Inuit Land Claims Agreement*: The Labrador Inuit land claim agreement was signed in 2005. Under the *Labrador Inuit Land Claims Agreement*, the Nunatsiavut government has the exclusive authority to establish, impose and collect fees, charges, rents and royalties for commercial harvesting of plants in Labrador Inuit lands.

In chapter 1 General Definitions and Interpretation of the agreement "Inuit Law" means a law of the Nunatsiavut Government and includes (a) subordinate legislation under a law of the Nunatsiavut Government; and (b) an Inuit customary law proclaimed, published and registered in accordance with part 17.5 (dealing with registry of laws). It states that the Nunatsiavut Government shall (a) maintain a public registry of the Labrador Inuit constitution, Inuit Laws, including Inuit customary laws in respect of matters within the jurisdiction of the Nunatsiavut Government and by-laws.

Labrador Inuit have the right to exercise their rights to harvest wildlife and plants subject to Inuit laws (where the Nunatsiavut Government may make laws in relation to the collection and publication of Inuit traditional knowledge with respect to wildlife, plants and habitat) and states that the Nunatsiavut Government may make laws in relation to the quantities of plants that may be harvested in Labrador Inuit Lands. The prior informed consent principle and its application is applied through the Torngat Wildlife and Plants Co-Management Board which has the powers and responsibilities to make recommendations regarding research respecting the conservation and managements of wildlife, plants and habitat, the activities that may be carried out in areas of important biological activity; these innovations point to their very cultural identity. The Inuit have enshrined into their culture their own customary laws to protect their own traditional knowledge. The customary laws around Inuit intellectual property rights have maintained the succinctness of Inuit culture and maintained order and respect within the Inuit setting and are integral to their cultural identity.

Traditional ecological knowledge is advocated by land claims groups such as the Inuit land claims groups and is reflected in their particular agreements. It is recognized as a key to managing the wildlife and ecological systems and in resource and planning activities. The Inuit land claims agreements, which are the legislative measures that provide the facilitation of the issues of traditional knowledge. The *Nunavut Land Claims Agreement* calls for the Nunavut Wildlife Management Board to be established (Article 5 and 15). The Board's duties include: establishing and managing harvest levels; allocating resources to

other residents; identifying wildlife management zones; approving plans for wildlife habitat management within conservation areas, territorial parks and national parks; providing advise about compensation by commercial and industrial developers that cause damage to wildlife habitat; and regulating access to wildlife in the Settlement Area and it provides for powers to Inuit to regulate harvesting practices among members.

Furthermore, the Nunavut Government has developed a Qaujimajatuqangit (IQ) policy. It is a form of knowledge for understanding and explaining Nunavut (Simpson, Larry, 2004 p. 10) IQ embodies Inuit traditional knowledge and values and guides the government in framing decisions, policies and laws that reflect the key philosophies attitudes and practices of Nunavut majority. It goes further than contextualizing traditional knowledge of Inuit (ibid.).

The new ***Nunavut Wildlife Act*** points out in its preamble that IQ means traditional Inuit values, knowledge, behaviour, perceptions and expectations (Simpson, Larry, 2004 p. 10). "IQ is not fixed and evolves and is responsive to needs whether those needs are to provide an adaptive understanding of wildlife, define Inuit culture and identity, or adopt a strategic approach of interpreting past, present and future relations with Canada and the world at large" (ibid.). This new legislation spells out the various principles of IQ. Despite the new policy, there are recognized challenges in "the discourse and its historical antecedents, and between the cultural context and future directions" (ibid.).

This application in the new legislation in Nunavut demonstrates how access and benefits sharing may be possibly handled and controlled in one Inuit land claims region. The fact that it is legislation demonstrates the jurisdictional and strength of those provision. These principles also reflect the relationships that may be created with Inuit in Nunavut and others such as research and users of arctic genetic resources. This legislation provides an opportunity to fill in the gaps around research guidelines, which will be discussed further in this paper. It is progressive, reflective and consistent with the values of Inuit and their relationship to the land, its resources, each other and the relationship they wish to create with the world. The principles of IQ as mirrored in this legislation provides a rare opportunity for an Indigenous group to have their values to their resources reflected in the laws of the country they reside in, strengthens the principle of prior informed consent and applies the associated traditional knowledge in a manner that is consistent with goals of Indigenous people in handling ABS arrangements. (Text on Labrador Inuit Land Claims and Nunavut Wildlife Act from "Legislative Measures and Canadian Arctic: The Investigation of Status and Trends of Traditional Biodiversity Related Knowledge in the Arctic Regions" by Violet Ford 2005.)

The 2003 *Nunavut Wildlife Act* (NWA) that Inuit contributed to and developed ensures there are co-management regime for resources and that Inuit Quajimajatuqangit meet's Canada's obligation under the NLCA and the Convention on Biological Diversity. There are thirteen different Inuit Qaujimajatuqangit guiding principles included in the *Nunavut Wildlife Act* (NWA, section 8) which are:

(a) *Pijitsirniq/Ihumaliukti*, which means that a person with the power to make decisions must exercise that power to serve the people to whom he or she is responsible;
(b) *Papattiniq/Munakhinik*, which means the obligation of guardianship or stewardship that a person may owe in relation to something that does not belong to the person;
(c) *Aajiiqatigiingniq/Pitiakatigiiklotik*, which means that people who wish to resolve important matters or any differences of interest must treat each other with respect and discuss them in a meaningful way, keeping in mind that just because a person is silent does not necessarily mean he or she agrees;
(d) *Pilimmaksarniq/Ayoikyumikatakhimanik*, which means that skills must be improved and maintained through experience and practice;
(e) *Piliriqatigiingniq/Havakatigiiklutik*, which means that people must work together in harmony to achieve a common purpose;

(f) *Avatimik Kamattiarniq/Amiginik Avatimik*, which means that people are stewards of the environment and must treat all of nature holistically and with respect, because humans, wildlife and habitat are inter-connected and each person's actions and intentions towards everything else have consequences, for good or ill;
(g) *Qanuqtuurunnarniq/Kaujimatukanut*, which means the ability to be creative and flexible and to improvise with whatever is at hand to achieve a purpose or solve a problem;
(h) *Qaujimanilik/Ihumatuyuk*, which means a person who is recognized by the community as having in depth knowledge of a subject;
(i) *Surattittailimaniq/Hugattittailimanik*, /…/ which means that hunters should hunt only what is necessary for their needs and not waste the wildlife they hunt;
(j) *Iliijaqsuittailiniq/Kimaitailinik*, which means that, even though wild animals are harvested for food and other purposes, malice towards them is prohibited;
(k) *Sirliqsaaqtittittailiniq/Naklihaaktitihuiluhi*, which means that hunters should avoid causing wild animals unnecessary suffering when harvesting them;
(l) *Akiraqtuutijariaqanginniq Nirjutiit Pijjutigillugit/Hangiaguikluhi Nekyutit InuupPiutigingitait*, which means that wildlife and habitat are not possessions and so hunters should avoid disputes over the wildlife they harvest or the areas in which they harvest them; and
(m) *Ikpigusuttiarniq Nirjutilimaanik/Pitiaklugit nekyutit*, which means that all wildlife should be treated respectfully.

These guiding principles provide direction for decision-makers when they are working in the area of wildlife. This is the first time that laws in Nunavut have truly incorporated Inuit Qaujimajatuqangit (see Government of Nunavut, http://www.gov.nu.ca and Nunavut Tunngavik www.tunngavik.com websites).

Other comprehensive land-claim settlements in **Canada** are the Council of Yukon First Nations (formerly the Council for Yukon Indians) *Umbrella Final Agreement* in 1993, the *Inuvialuit Final Agreement* in 1984, the *Gwich'in Agreement* in 1992, and the *Sahtu Dene & Metis Comprehensive Land Claim Agreement* in 1993. In **Alaska,** there is the Alaska *Native Claims Settlement Act* (ANCSA) in 1971 that provided Alaska's Indigenous peoples title to 44 million acres of land and paid $962.5 million. The settlement provided for the formation of 13 regional, 4 urban, and over 200 village Native corporations, which received the cash and acreage (Lee, 1995). However, the terms were very complex and not initially understood by the majority of Indigenous people and resulted in not being as beneficial for the Indigenous population as originally intended (Lee, 1995).

Case study: Existing national policy and legal framework in Russia

National laws on Indigenous rights: Article 69 of the **Russian Federation** Constitution guarantees the rights of minority Indigenous peoples in accordance with the generally recognized principles and norms of international law and the international treaties of the Russian Federation. Nevertheless, land use is the key issue for Indigenous peoples' life. Without land, Indigenous peoples may vanish as ethnic groups or at best, lose their ethnic identity. The federal legislation on Indigenous peoples' rights to land and other natural resources consists of two types of laws – ethnic-centered and natural resources-centered. The former are centered on Indigenous peoples' rights and norms in social life. The latter are centered on specific interests and needs of Indigenous peoples related to their traditional lifestyles. Regional legislation develops and particularizes federal legislation in terms of land and natural resource use on the territories of the components of the Russian Federation. The rights and interests of the Indigenous peoples who are not directly involved in traditional knowledge practices - those who live in cities and towns or prefer different jobs or occupations - are protected by a different set of laws.

National Laws on the use of nature: Recognizing Indigenous people's rights to traditional use of nature, the Russian Federation government has promulgated a number of federal laws, including:

the *RF Land Code* (October 25, 2001), the *Federal Law on Territories for the Traditional Use of Nature* (TTUN) (Northern, Siberia and the Far East Territories) (May 7, 2001), *Federal Law on Agreements Concerning Production Sharing* (December 30, 1995; updated January 7, 1999 and June 18, 2001), *Federal Law on Environmental Protection* (2002) and the *Federal Law on Specially Protected Territories* (1995), the *Federal Law 52 on Protection of the Animal World* (April 24, 2995), the *Federal Law Guaranteeing Indigenous Peoples' Rights in the Russian Federation*, the *Federal Law on Communal Principles for Indigenous Peoples of Siberia, Arctic Territories and the Far East* (July 20, 2000). Importantly, these laws guarantee and protect Indigenous peoples' rights to land use. In addition, Indigenous peoples are not derogated from any common rights guaranteed to all the citizens of the Russian Federation.

The federal laws have granted Indigenous peoples an absolutely new statute that protects their interests in traditional knowledge, identified in the concept of a "territory for traditional use of nature." The *Federal Law on Territories for Traditional Use of Nature* (TTUNs) (Northern, Siberia and the Far East Territories) specifies measures for environmental protection in TTUNs (Article 15). Protection of TTUNs is the responsibility of federal government, regional, sub-regional and local administrations, and representatives and communities of Indigenous peoples.

TTUNs are classified by the *Land Code* (Article 95) as strict protected areas that can be established on the lands historically occupied and used by Indigenous peoples, tribes, and their communities, according to procedures defined by Federal laws on the rights of Indigenous peoples (Article 97). The *Federal Law Guaranteeing Indigenous Peoples' Rights* subdivides TTUNs into settlements (temporary and stationary; camping grounds of deer-breeders, hunters, and fishermen); lands and water basins used as pastures, for hunting and fishing, and for harvesting wild plants; historical and cultural sites and objects; sites of ancient settlements and tombs, and other cultural, monumental, and religious objects of value.

The *Federal Law on the Rights of Indigenous Peoples* offers a number of measures to ensure the implementation of the national environmental policy such as for example: development of federal programs on land and other natural resources use and protection; restrictions on non-traditional knowledge practices on the TTUNs. The *Federal Law on Agreements Concerning Production Sharing* (December 30, 1995; updated January 7, 1999 and June 18, 2001) requires the participation of local authorities in the development of contracts for the use of land within the boundaries of Indigenous peoples' territories. Local governments do participate in negotiations but not always as equal partners. When the national natural resources are involved in the deal, the interests of Indigenous peoples may suffer, yet no compensation payment is paid.

Sakhalin Island - TTUNs and oil and gas extraction: Recently the Russian Association of the Indigenous Peoples of the North (RAIPON) has tried to settle the conflict between the Indigenous peoples of Sakhalin Island – the Nivkhi and the Negildaltsy – and the companies extracting and transporting oil and gas. Hunting, reindeer-breeding and fishing being the basis of its traditional economies, the local Indigenous population depends greatly on conservation of the territory's ecosystem (forests, rivers), which is impacted by oil and gas pipeline construction and the regime of oil and gas transportation. Though there is a law on benefit sharing, it does not work. In a few cases oil and gas companies paid some money to local administrations as compensation for the damage caused to reindeer breeders, but no other damages to the TTUN were considered. The participation of Indigenous peoples or their representatives in the decision making process on the commercial use of the TTUN was not and is not ensured.

National laws on special protected territories: The *Federal Law on Special Protected Territories* (March 14, 1995) refers to 'special protected territories' as part of the national patrimony and classifies them as lands, water surfaces and airspaces allocating the objects and complexes, which

have environmental, scientific, cultural, aesthetic, recreational, and sanitary value. The government has withdrawn these territories from use (totally or partially) and provides them with a special protection regime. According to their regime and environmental status these territories are subdivided into: federal national reserves; including biosphere reserves; national parks; nature parks; federal national preserves; nature memorials; dendrological parks and botanical gardens; recreational zones and resorts. Legislation on special protected territories is especially important for maintaining Indigenous peoples' lifestyles and for protecting biodiversity. The concept of special protected territories is used in the new Law on TTUNs. (Case study based on "An Assessment of the Implementation of the Russian Government's International Commitments on Traditional Forest-Related Knowledge from the Perspective of Indigenous Peoples" by Vladimir Bocharnikov, 2005a.)

4.2.3 National and regional strategies and activities, protected areas

Greenland "has provided a model for the inclusion of Indigenous values in social and economic development and in the design and implementation of environmental policy" (Nuttall 1994, p. 1).

Greenland is rich in natural areas and resources. Greenland's challenges regarding biodiversity preservation are mainly connected to hunting and fishing. According to a review by the Greenland Institute of Natural Resources in 2000, 39 wild animal species are mentioned as essential from an exploitation viewpoint. Large parts of the island lack human population making the protection of "conservation-worthy and rare environments" more feasible (The Biodiversity of Greenland, 2003, p. 135). Greenland has an area of about 2.1 million km² with a coastline of about 40,000 km and there is the marine area consisting of 0.3 million km². According to "The Biodiversity of Greenland," a large portion of Greenland's area has some form of protection. The world's largest national park is located in Northeast Greenland and covers 957,000 km². In addition to this park, there are six other protected areas in Greenland. Traditional hunting and fishing are allowed in some of these areas. Nordic wetlands are vital for biodiversity of species and as source of good water. The Greenlandic Home Rule has acknowledged its responsibility to safeguard its wetlands. Greenland's parliament has ratified in 2003 a new environmental protection law. With this law, Greenland is now capable of meeting the demands of the Biodiversity Convention (Arctic Bulletin 2/04, p. 20). Greenland is also relating itself to the Convention on Trade in Endangered Species of Wild Fauna and Flora (Arctic Bulletin 2/04, p. 20).

The **Norwegian** state has focused on the political dimension and management issues instead of documenting traditional knowledge. However, the latest trends in Norway show that there are many initiatives and measures taken in relation to biodiversity and Indigenous people. Norway also has plans to adopt a *Biodiversity Act* (NOU 2004:28). Indigenous issues are included in this investigation, and the Sami Parliament has been involved in reviewing biodiversity legislation in Norway (NOU 2004:28). The *Nature Conservation Act*, the *Planning and Building Act* and other legislation give Sami certain participatory rights (CBD, Third National Report-Norway).

The Sami Parliament has prepared an annex (vedlegg) to the Norwegian Action Plan on Biodiversity to the Stortinget (St.meld. nr. 42 (2000-2001) Vedlegg 1). In relation to the national assessment of the CBD in Norway, this annex is as important as the input from the state departments (Tone Solhaug, Ministry of Environment, e-mail letter of June 24, 2005 to Helander-Renvall). The Plan of Sami Parliament states as follows: "It is a central goal to establish resource management policy and practices that hinder over-usage, threat and damage. Environmental values must be safeguarded for the future generations" (author's translation from Norwegian). According to the Sami Parliament, the concept "sustainable development" means more than environmental protection in the traditional sense. It refers largely to economic and cultural precondition for maintenance and development of the resources and nature (St.meld. nr. 42 (2000-2001), Vedlegg 1). The Norwegian state also has a plan to further strengthen the Sami research and higher education. Traditional knowledge gets space in such plans (St.meld. nr. 20 (2004-2005); See also,

St.meld.nr 34 (2001-2002), Kvalitetsreformen om höyre samisk utdanning og forskning).

In the National Action Plan for Biodiversity in **Finland**, 1997-2005, Sami issues are included. It is stated that in the "interest of biodiversity, the sustainable use of biological resources in the northern hemisphere, and the traditional rights of the Indigenous Sámi people, the use of natural resources should be subjected to careful scrutiny as an aspect of land use in the northern parts of Finland. This pertains particularly to reindeer husbandry /…/ and other traditional Sámi forms of land use in relation to forestry, mining, trekking, tourism and the regulation of land use in large protected areas within the Sámi region" (National Action Plan for Biodiversity in Finland, 1997-2005, p. 86). A general observation is however, that by implementing this plan one cannot stop the decreasing trend regarding biodiversity in Finland (Suomen kestävän kehityksen toimikunnan kokous 3.5.2005).

In Finland, the different actors have realized how important it is to safeguard biodiversity through various activities. However, information about biodiversity is scattered and difficult to make use of. According to the National Action Plan for Biodiversity in Finland, (1997-2005, p. 86): "The management, use and protection of natural resources within the Sámi homeland region will be co-ordinated as a co-operative effort involving the Sámi Parliament and other authorities to ensure that Indigenous livelihoods and the Sámi culture are preserved." The Sami Parliament in Finland is a member in the Finnish National Biodiversity Committee and its monitoring group. The Finnish Ministry of Environment has been supportive to the Sami Parliament's work with sustainable development and is planning to investigate the possibilities to implement article 8(j) as related to the Sami perspective.

Finland has 13 regional environment centres, which control and develop land use planning and construction (www.ymparisto.fi). Lapland's Environment Centre has been conducting a 4-year project since 2004 with the aim to investigate cultural surroundings including old building traditions and places in Lapland. The Sami Parliament has made initiatives regarding the investigation of Sami cultural environment and Parliament is connected to this project. The Finnish Forest and Park Services, Metsähallitus, has services in the SIIDA-museum in Inari. The Finnish Forest and Park Service runs in Sevettijärvi together with local Skolt Sami a Skolt heritage house with an aim to preserve the Skolt Sami culture (www.luontoon.fi). Sami Parliament has advanced plans to establish a Sami cultural centre in Inari (Saamelaiskulttuurikeskus, Toimikunnan mietintö 2005).

In 1991, Finnish Parliament passed the *Wilderness Act*, and 12 areas in Lapland were designated as wilderness areas. The purpose of the *Wilderness Act* is to maintain the wilderness character and species of an area, secure Sami culture, secure traditional means of livelihood and develop multiple use and its preconditions. The *Wilderness Act* protects reindeer herding, meaning that Finnish Forest and Park Service has to be careful in forest management and recruiting services planning, that no harm or problems is caused for the reindeer herding (Tynys 1995).

Anna-Liisa Sippola (2002) counts four negative factors relevant for the preservation of species and habitats in Finnish wilderness areas: 1) lack of goals for biodiversity conservation in legislation, 2) complicated legislation and management organizations regulating different forms of use, 3) lack of trust between authorities, stakeholders, and interest groups and 4) insufficient possibilities for local participation.

The purpose of Natura 2000-network, a European ecological network, is to preserve biodiversity by maintaining or restoring natural habitats of community importance (Europa environment, http://europa.eu.int). In negotiations concerning the management of Natura 2000-network, it was pointed out by Sami parliament that management planning of Natura 2000 areas should not start before the question on ownership to land is solved (Leskelä, e-mail interview in May 2005).

Finnish Forest and Park Service in its work in the protected areas of Upper-Lapland recognizes to a certain degree the importance of local and Sami knowledge in the protection and study of distribution of endangered species. In the management planning of wilderness areas the views of local people are heard. Local knowledge on different biotypes, rare and common plants and plants used by local people is collected. Management of traditional biotopes is done together with local people (Stolt, e-mail interview in June 2005).

In **Sweden**, the principles of the CBD have not been properly implemented in a political sense in relation to the Swedish Sami (Yttrande Sametinget 2004). The decision of the Conference of Parties V/16, 12 "urges Parties and Governments and, as appropriate, international organizations, and organizations representing Indigenous and local communities, to facilitate the full and effective participation of Indigenous and local communities in the implementation of the Convention." The Swedish reports to the Secretariat of the CBD show that there are some scattered measures taken to implement the CBD as related to the Sami people and their knowledge. Swedish Biodiversity Centre (Centrum för biologisk mångfald) gathers information about the Sami traditional knowledge. Forestry often times affects negatively Sami herding activities and there are many conflicts in Sweden in relation to land use. The Swedish government has a policy to involve representatives of the Sami people in international negotiations that concern art. 8(j), e.g. in CBD and WIPO.

According to Sami Parliament in Sweden, in several state investigations (for instance SOU 2002:49 and SOU 2003:31), the Sami issues or discussions concerning biodiversity-related knowledge are left out (ibid.). For instance, Sweden has investigated a new reindeer herding policy (SOU 2001:101. En ny rennäringspolitik). Biodiversity-related issues are left out from the final product (see, Yttrande Sametinget 2003). The Sami Parliament in Sweden has designed an environmental program.

In Sweden's implementation of article 8(j) the term "Indigenous and local communities" has been interpreted to apply to the Sami people, traditional farmers in mountain and coastal areas, and traditional fishermen. This definition may in fact function as a smoke screen regarding the efforts made to implement article 8(j) in relation to the Sami population (cr. with the Third national report of Sweden to SCBD).

Regarding protected areas in Swedish Sápmi one example is given here: In **Sweden**, the Lapponian protected area is located in Norrbotten County. It is a homeland of many Sami and the landscape has been shaped by their activities. Still, 200-250 Sami use this are as herding lands. The responsible national body is the Swedish Environmental Protection Agency. The area consists of 940,000 ha land, which is mainly owned by the State. This area consists of four national parks, two nature reserves and three other protection areas. Botanically, this is in one of the most interesting mountain areas of Sweden containing many scarce species. The fauna comprises some threatened species (see http://sea.unep.wcmc.org/sites/wh/lappon.html).

In **Russia** according to Bocharnikov (2005a), the Russian Federation "National Biodiversity Conservation Strategy" (2001) declares that, "for the organization of effective work on the development of public awareness, it is necessary to consider the characteristics of various groups of the people… Indigenous peoples and other minorities. The morals and ethics of Indigenous peoples and other minorities are firmly anchored to their subsistence activities. The main task is to support and encourage their traditional views and practices beneficial for the environment and biodiversity" (Article 4.5 development of public awareness, education and propaganda). Bocharnikov (2005a) writes, "The Russian Federation Academy of Science has organized research in the areas prioritized by the National Biodiversity Conservation Strategy. By the end of 2005 it will be possible to get expert information and conclusions on the biodiversity of national forest ecosystems, and thereby to gain some insight into the forest resources of the Russian Federation."

In Russia, an ethno-socio-ecological examination has been done in order to implement the recommendations of the Convention on Biological Diversity. In November 2004 – February 2005 the first part of the ethno socio-ecological examination was carried out in the project "Ternejles" in the Samarga region in co-operation with RAIPON and the Association of the Indigenous People of the Primor Land. The main aspect of this ethno- socio-ecological examination is to stress the necessity to include cultural, social and ecological aspects in one integral process in evaluation of projects that may have effects on the environment (Bocharnikov, 2005b). In Vladivostok on May 26th, 2005 the General Agreement between the project "Ternejles" and the Association of Northern Indigenous Small Peoples of Primor Region was signed. Among the main objectives of this agreement were: "the importance to create conditions for equal partnership of Indigenous peoples in the socio-economical development of communities and management on traditional territories, to exclude or minimize all negative effects of the realization of economical projects of Ternejles to Indigenous peoples and to maximize the enlargement of possibilities of the increase of their welfare and to present the Indigenous peoples the realistic practical possibilities to use the potential of the projects of industrial forest exploitation project "Ternejles", ensuring the employment, development of culture and education, support of traditional land use and new forms of activities of Indigenous peoples" (Bocharnikov & Sulyandziga 2005).

Protection of sacred sites of Indigenous peoples in the Russian Arctic: A joint project "The Conservation Value of Sacred Sites of Indigenous Peoples of the Arctic: A Case Study in Northern Russia" was carried out by RAIPON, CAFF, IPS and Danish Protection Agency (DEPA). In the project report (2002, chapter 3, p.8) it is noted that "Federal and regional legislation in the sphere of Indigenous peoples rights creates the preconditions necessary for protection of a traditional way of life for Indigenous peoples, their traditional economic activities as reindeer herding, fishing and hunting, and also protection of the environment. However, there is no experience yet in applying these toward protection of Indigenous peoples' sacred sites." According to Bocharnikov (2005a) none of the sites have been granted the status of a 'sacred site.'

Case study: Protecting biological diversity in the Sakha Republic - Russia

> The Ministry for Nature Protection of the Sakha Republic is the only one [nature protection ministry] in the Russian Federation. The government of Sakha Republic acknowledges the necessity of protecting ecosystems for nature conservation and use by Indigenous peoples. Sakha has had the Ministry for Nature Protection in place for 19 years. The republic has its own red data book and was the only Russian region that was able to finance the count of its animal populations (moose, wild reindeer) in 2004. The ministry is also working to find compromises between diamond extraction and nature protection. Now some of the major diamond companies are sponsoring nature conservation activities around the mining areas.
>
> Despite the dangerous trend of destruction of northern ecosystems, in the case of Sakha Republic it is mainly rapid development of mining industry and irrational use of the natural resources; the region is still one of the few places in the world with undisturbed environment and abundant diversity of flora and fauna. Sakha Republic has created one of the world's biggest systems of protected areas "Ytyk Kere Sirder" (Holy Graceful Places). In the system of Special Protected Natural Territories, protected areas were given names in the Yakut language. The system incorporates four types of protected territories that are distinguished by the level of aesthetic, natural, ecological and economical value: Aan Aiylgy (national natural parks), Erkeeii Sirder (resource reserves), Uluu Tuelbeler (protected landscapes) and Aiylga Menelere (natural monuments), and two zapovedniks, federal-level protected areas. Today more than one-fifth of the territory of the republic is occupied by natural reserves of different statuses. The overall administration of the network falls under the responsibilities of the Sakha Ministry of Nature Protection (Ministry for Nature Protection of the Sakha Republic, Yakutia, 2004).

> The importance of Indigenous cultures has been seriously taken into account in the system of Special Protected Natural Territories (SPNT). Implementation of the state ecological program over years 2002-2006 provides for the development of the special protected natural areas, such as preservation of traditional activities of Indigenous peoples of Yakutia, for example renewal of nature-saving traditions and careful relations with wildlife. In addition to conservation of natural resources and species protection, resource reserves (Erkeii Sirder) are set up with the specific aim of conservation of human habitat for the Indigenous people of the North to reside and arrange optimal conditions in order to develop their culture in the natural way, conservation of traditional forms of activities and lifestyle as well as ecological education of the population. Within the resource reserves, also the sacred places of the Indigenous peoples are taken into account. For instance, Khatymi reserve was founded in 1999 into an area belonging to the Neryungri town administration. The total area is 392,199 hectares. Kolyma-Koren reserve was formed in 2002 in Nizhnekolymsky district (ulus), Sakha. The reserve is located in the northern part of the district. The total area is 150,000 hectares. (From "Sakha Republic Biodiversity and Local Knowledge" by Kaisu Mustonen & Tero Mustonen 2005.)

In the **Canadian** and **Alaskan** North, there are several co-management boards where Indigenous people participate in the management of their natural resources. There is a very broad range in the interpretation of co-management. However, as Tracy Campbell (1996) explains, "co-management has been described by some as an inclusionary, consensus-based approach to resource use and development. Co-management has also been described as the sharing of decision-making power with non-traditional actors in the process of resource management." These non-traditional actors would be such people as local resource users and Indigenous people (Campbell, 1996). "Co-management has also been used to describe the process of combining western scientific knowledge and traditional environmental knowledge for the purpose of improving resource management" (Campbell, 1996). The level of participation by Indigenous peoples in these management boards can vary but in the Canadian territories, Indigenous people have a legally defined role within these co-management structures, which provides Indigenous people a strong voice in the management of their resources.

Berkes (1994) has defined seven levels of participation ranging from "co-operation" where the communities start to have input into management process (where local knowledge is used) to full "partnership and community control" where it is a partnership of equals, joint decision-making is institutionalized, and responsibility is delegated to the community where feasible. With Indigenous people and communities participating where they are joint partners it is possible though their participation that traditional knowledge can be incorporated into the management of resources and parks.

There are many examples of co-management in the north where traditional knowledge is being used with scientific knowledge to provide more information than either one would have on their own. For example, the *James Bay and Northern Quebec Agreement* of 1975 in **Canada** gave the management regarding beavers to Cree hunters and their organizations (Moller et al. 2004). The Cree organizations had been given access to aerial survey data from the provincial resource management agency that provided accurate counts of beaver lodges, but these surveys could not provide data that would show that beavers actually occupied a specific lodge. Whereas, the Cree hunters knew the proportion of lodges in a given area that were actually occupied, but not the total number of lodges in their territories (Moller et al. 2004). With both forms of knowledge complementing each other, the management organizations were capable of better management of the beaver resource.

Co-management boards are also developing guidelines regarding how traditional knowledge is to be used and this is developing especially in the area of environmental impact assessments. For example in **Canada,** the federal government implemented the *Mackenzie Valley Resource Management Act* (MVRMA) that provides northerners with the ability to participate in decision-making regarding environmental and natural resource issues. The MVRMA created the Mackenzie Valley Environmental

Impact Review Board, which is an aboriginal co-management board set up to handle environmental assessments in the Mackenzie Valley in the Northwest Territories. In 2005 the Board released their "Guidelines for Incorporating Traditional Knowledge in Environmental Impact Assessment," which outlines the process for incorporating traditional knowledge into baseline information, project design, impact prediction, and mitigation methods for developers and environmental impact assessment activities. With the increased involvement of local and Indigenous people in the management of the natural resources that they depend on, and the acknowledgment that traditional knowledge is a valid and integral component in the development and management of natural resources shows progress is being made. However, it is important to remember that for co-mamagment regimes to work that Indigenous traditional knowledge and western scientific knowledge systems must work together and that Indigenous people must be fully empowered in the participation and management of their natural resources.

4.2.4 Local organizations and initiatives, trans-regional initiatives

Sami: As an example of local and regional level contributions to the discussion on biodiversity and sustainable development can also be mentioned a couple of projects by the municipalities of the north in **Norway** and **Finland**. The aim of the first project "Deatnu" was to promote local economic and cultural life from the vantage point of sustainable development. It concentrated on developing tourism in the Deatnu/Teno valley area in the Tana municipality (Norway) and Utsjoki municipality (Finland). The project collected information on customary law and traditions in relation to the traditional salmon fishing of local Sami people. The project also assisted local tourism enterprises in the planning of their tourism activities and helped them to find partners and markets (EU Interreg Sápmi Projekti-Deatnu projekti. Loppuraportti 7.2.2001). The second project "Multiuse plan for the Teno River 2004-2010" refers to a project between four northern municipalities: Karasjok and Tana in Norway and Utsjoki and Inari in Finland. The main aim is to use the resources of the Deatnu/Teno River system in a sustainable way for the benefit of local economical activities and Sami culture. One aim of the multiuse plan 2004-2010 is to increase the possibilities of local people to influence the administrative planning processes regarding the Teno River. In addition, cooperation between the local municipalities and local people in relation to the management and utilization of the Teno River will be promoted. Both projects have received financial support from the EU, Flerbruksplan for Tanavassdraget 2004-2010 (a draft). Both projects have co-operated/co-operate with local people and different local and regional authorities.

Chaturvedi writes in 1996 (p. 165) regarding **the Kola Sami** situation as follows: "The only silver lining in the dark cloud seems to be that the cultural and political interaction between the Sami of Russia and those of the Fennoscandian countries has increased." In 1983, Kola Sami were allowed to send representatives to the Nordic Sami Council's conference. This was a turning point for the Russian Sami. They established their own political organizations and institutions and became a member of Sami Council. The Sami Women's organization Sáráhkká has a branch on Kola Peninsula.

There are several local Indigenous organizations in **North Russia**, Siberia and Far East, for example Yasavey, the Association of Nenets people, Association of the Indigenous Peoples of Chukotka, Association of Indigenous Peoples of the North of Khabarovskiy Kray, Kamtšatka Council of Indigenous Societies of the Jelizovski Region, Indigenous Council of Kamtšatka Itelmen, to mention few (ANSIPRA, www.npolar.no/ansipra). The Institute for the Problems of the Indigenous Small Peoples of the North is based in Sakha republic (www.ysn.ru). The Russian Association of Indigenous Peoples of the North, Siberia and Far East of Russian Federation (RAIPON) is a non-government organization, which is "formed on territorial and territorial-ethnic principles" (RAIPON, www.raipon.org).

In **Canada**, the Gwich'in Renewable Resource Board (GRRB) was established under the guidance of the *Gwich'in Comprehensive Land Claim Agreement* (GCLCA) to be the main instrument of wildlife, fish and forest management in the Gwich'in Settlement Area (GSA). The GRRB have implemented many studies, projects, and programs based on traditional knowledge. Some of these are the Gwich'in

Environmental Knowledge Project (GEKP), Community - Land Relationship (CKP) Project, Community-Based Ecological Monitoring Program, Traditional Knowledge on Travaillant Lake & System, Rat River Biodiversity, Cultural/Historical Assessment, and the Gwich'in Ethno-botany Study.

The Gwich'in Tribal Council established the Gwich'in Social and Cultural Institute (GSCI) in response to concerns about the decline of Gwich'in culture and language. The GSCI has conducted many research projects working with Elders. The combination of modern research methods with traditional knowledge has resulted in research that displays the best of both. The research has focused on such areas as the study of place names, traditional land use, ethnobotany, ethnoarchaeology, elder's biographies, genealogy, and a Gwich'in language dictionary. They produced the publication "Gwich'in Ethnobotany: Plants Used by the Gwich'in for Food, Medicine, Shelter and Tools" (see the GSCI website at http://www.gwichin.ca).

The community of **Sanikiluaq** on the Belcher Islands in southeastern **Hudson Bay** hosted an initial regional meeting of nine coastal and island communities in October 1992. At this meeting, the Indigenous delegates discussed their environmental concerns, selected communities for involvement in the study, and identified the discussion topics for a series of regionally based meetings. Six regional, community-based meetings were held in 1992 and 1993. Seventy-eight Elders, hunters and women participated in these meetings and shared their knowledge concerning rivers, currents, sea ice, weather, animals, human health, traditional management, and the effects of development in the coastal, marine and some inland areas of the Hudson Bay bioregion.

Indigenous knowledge recorded on map overlays, audiotapes and paper was translated and transcribed into English in the host communities and sent to the study office in Sanikiluaq. There it was organized into general topics and synthesized for review and verification by the same IK holders during a second series of meetings in the fall of 1993, and a second regional workshop in January 1994. In May 1994, 12 IK holders from the study presented and discussed their findings on climatic changes, changing current and ice regimes, long-term effects of flow diversions, habitat change and loss, animal population and migration changes, contamination of the Hudson Bay food web, and changing land use patterns. This was done in a joint workshop with an equal number of scientists familiar with or working in the Hudson Bay area. The implications of the environmental changes for social, cultural and physical systems were also discussed. In the year 2000, the Environmental Committee of the **Municipality of Sanikiluaq** became aware of a resurging interest in industrial development of the mineral, oil and gas and hydroelectric potential in the **Hudson Bay** bioregion. In May 2002, a joint Municipal Council-Environmental Committee meeting with the Premier of the Government of Nunavut and Deputy Minister of Executive and Inter-Governmental Affairs affirmed the value and validity of the practice, in recognition of the fact that a healthy Hudson Bay is essential for the success and well-being of Sanikiluaq and the other coastal and island communities in the Hudson Bay bioregion. (Text on Sanikiluaq from "Legislative Measures and Canadian Arctic: The Investigation of Status and Trends of Traditional Biodiversity Related Knowledge in the Arctic Regions" by Violet Ford 2005.)

In **Alaska,** the Indigenous people have formed many organizations such as the Alaska Native Science Commission, First Alaskans Institute, Consortium for Alaska Native Higher Education, and the Alaska Native Knowledge Network (ANKN). The ANKN is a resource for compiling and exchanging information related to Alaska Indigenous knowledge systems and ways of knowing. This is a comprehensive resource for Alaska Indigenous people on education, culture, and knowledge systems. The Native Science Commission has several projects regarding traditional knowledge such as the Alaska Traditional Knowledge and Native Foods Database which "contains information on existing measures of contaminants in species of fish and animals harvested by Alaska Indigenous peoples, harvest and consumption data, nutrition data, descriptions of the role of harvest and Indigenous food consumption in communities, and examples of community initiatives taken in response to concerns about environmental change" (Traditional Knowledge and Contaminants Project: Progress Report 2000). This database provides a wealth of knowledge on contaminant measures; and the harvest, consumption, nutritional

value, and cultural value surrounding Indigenous foods, and Indigenous knowledge about environmental change" (ibid.).

4.2.5 Capacity building, education, language and cultural programs

Inuit in **Greenland** have received through political determination Home Rule status. Home Rule means self-determination and self-government. Greenlanders get instruction in schools in their own language. There are improvements regarding housing, education and health care. Interest in the knowledge-intensive accumulation strategy has emerged (Jónsson 1996, p. 136) so that effort is put on research and education. Greenlanders have teacher training college and universities where they can learn in their own language and culture. An Arctic technology centre was established in 2000 to support training, knowledge and development based on technical knowing. Publishing of Inuit texts takes place. However, the educational sector still lacks methods and material in which traditions and traditional values are described and transferred to new generations.

Sami in Finland: As already mentioned, a new *Sami Language Act* was enacted in 2004. The new act aims to protect and promote all three Sami languages spoken in Finland. The Sami Parliament, within the frame of its resources, promotes the use of all three Sami languages in Finland. In the case of Inari Sami, successful work has been done in order to maintain the language. In 1997, the Association of Inari Sami Language started language "nest" - activity for Sami children who do not speak the Sami language. A "nest" is a kind of kindergarten that teaches Native languages to children. The language nest has had remarkable results for the Inari Sami. The status of Inari Sami has increased (IWGIA 2005). The achievements are evident. However, the language nest is not a permanent institution with secure funding.

In Kautokeino **Norway,** there is the Resource Centre for the Rights of Indigenous Peoples. At the Arctic Centre, University of Lapland, Rovaniemi, **Finland** there is a Department for environmental rights.

RAIPON has a journal that is disseminated to over 700 Indigenous settlements in the **Russian Arctic**. A program is designed to develop the capacity of regional and central organisations of the Russian Indigenous groups in the field of environmental knowledge, information, etc. The importance of local languages and distinctive small cultures is being recognized in the Republic of **Sakha**. Local languages are being taught in schools and in the Yakutsk state university there are various programs for traditional cultures. Laboratories of small cultures have been established in schools in Yakutsk and also in smaller communities, such as Chersky and Andreushkino. In these laboratories, languages as well as handicraft traditions are kept alive. The main problem with small languages is the lack of their everyday use and the strong status Russian language now has all over Sakha.

In **Alaska** and northern **Canada,** there are several initiatives to promote traditional knowledge in education and language programs. In Alaska Barnhart and Kawagley (2005) state that:

> "To address the issues associated with converging knowledge systems in a more comprehensive way and apply new insights to address long-standing and often intractable problems, in 1995 the University of Alaska Fairbanks, under contract with the Alaska Federation of Natives, and with funding from the National Science Foundation, entered into a 10-year educational development endeavour – the Alaska Rural Systemic Initiative (AKRSI). The most critical feature of the context in which this work has been situated is the vast cultural and geographic diversity represented by the 16 distinct Indigenous linguistic and cultural groups distributed across five major geographic regions in Alaska."

A statewide network of school districts was formed though AKRSI that serves 176 rural schools and nearly 20,000 predominately Indigenous students. The initiative is implementing an education reform that is focusing on integrating local knowledge and pedagogical practices into the education system (Barnhart

& Kawagley, 2005). The Alaska Native Knowledge Network is a partner of AKRSI which has culturally-based curriculum resources that demonstrate ways in which Indigenous and Western knowledge systems can be used in school curriculum that show a balanced and comprehensive approach. There is material ranging from teaching guides to the *Alaska Native Claims Settlement Act*, traditional knowledge, languages, and subsistence/cultural camps with Elders, to teaching resources that make science and math meaningful for Indigenous students (see the ANKN website at http://www.ankn.uaf.edu).

In **Canada** there are many education programs ranging from elementary to post-secondary school. One interesting program is Nunavut Sivuniksavut (NS), which is a unique eight-month college program in Ottawa for Inuit youth from Nunavut. This program prepares students for college and university, and careers opportunities created by the *Nunavut Land Claims Agreement* (NLCA) and the Government of Nunavut. Students learn about Inuit history and culture, organizations, the NLCA, contemporary Inuit issues, and Inuit-government relations (see the Nunavut Sivuniksavut website at www.nstraining.ca). This program prepares Inuit youth to become leaders in their communities while having a solid grounding in their culture.

4.2.6 Research, research guides, publications

There is a critical need to make use of all available knowledge (Young 2000). Research shows that active local participation in different research projects contributes to project success. Moreover, traditional knowledge has significant value in research, for instance in relation to climate change and community visits by researchers are a key aspect of generating interest in project activities (Inuit observations on Climate Change, 2001; Circumpolar Sustainable Development 1994).

Some of the measures taken in order to document and develop knowledge of the **Sami** are: in **Sweden, Ajtte -Swedish Mountain** and **Samimuseum,** has published together with Ingvar Svanberg and Håkan Tunón a book on Sami ethnobiology (2000). This book gives many examples on the meaning of landscape, nature, flora and fauna for the Sami. In addition, other museums gather information and arrange exhibitions connected to biodiversity: Tromsö Museum in Tromsö, **Norway** and SIIDA in Inari, **Finland** are working with these issues. Tromsö Museum in Tromsö, **Norway** has a publication "Ottar" that contains much information about the nature of the north. Nordic Sami Institute, located in Kautokeino, Norway, has research on Sami nature, culture and knowledge. A Sami company "Hommát" based in Deatnu in North Norway promotes Sami culture by arranging seminars and courses in weather prediction, fish and reindeer skin preparation and Sami food. Oulu University in Oulu, Finland has the Giellagas-institute for Sami language and cultural studies. The University of Lapland has established in early 2005 Arctic Indigenous Peoples and Sami Research Office to support Sami and Indigenous research and education. This research office has as one of its major aims to investigate traditional ecological knowledge.

In late 2000, the international community-based project Snowchange was started in Lovozero region in Kola Peninsula, **Russia**. This project focuses on documenting climatological and ecological observations of the circumpolar Indigenous peoples. The project cooperates closely with Indigenous groups and scientists.

In **North America** there are many initiatives affecting traditional knowledge guidelines, policies, and ethics regarding the protection of traditional knowledge and research. Indigenous organizations, universities, and governments have conducted these initiatives. In **Alaska** there are the "Principles for the Conduct of Research in the Arctic" prepared by the Social Science Task Force of the U.S. Interagency Arctic Research Policy Committee. These guidelines are to ensure researchers working in the North, who have an ethical responsibility toward Indigenous people; their cultures, communities, and the environment conduct their research in an ethical manner. The Alaska Federation of Natives developed "Guidelines for Research" in 1993, which requires that all researchers planning to conduct studies among Alaska

Indigenous people must comply with the following research principles:

- Advise Indigenous people who are to be affected by the study of the purpose, goals and timeframe of the research, the data gathering techniques, the positive and negative implications and impacts of the research
- Obtain informed consent of the appropriate governing body.
- Fund the support of a Native Research Committee appointed by the local community to assess and monitor the research project and ensure compliance with the expressed wishes of Indigenous people.
- Protect the sacred knowledge and cultural/intellectual property of Indigenous people.
- Hire and train Indigenous people to assist in the study.
- Use Indigenous languages whenever English is the second language.
- Guarantee confidentiality of surveys and sensitive material.
- Include indigenous viewpoints in the final study.
- Acknowledge the contributions of Indigenous resource people. Inform the Native Research Committee in a summary and in non-technical language of the major findings of the study.
- Provide copies of the study to the local people (See guidelines at http://www.ankn.uaf.edu/IKS/afnguide.html).

In **Canada,** there are many similar guidelines, policies, and legislative acts to help insure that research is conducted in an ethical manner. The Gwich'in Tribal Council had the "Traditional Knowledge Policy: Working with Gwich'in Traditional Knowledge in the Gwich'in Settlement Region" developed by the Gwich'in Social and Cultural Institute in 2004. This policy defines the Gwich'in guiding principles, responsibilities, authority, and accountability for researchers and the Gwich'in Tribal Council. The policy provides a research agreement framework that allows researchers and the Gwich'in to negotiate the terms of agreement regarding research conducted. This ensures that both parties have full knowledge of their rights and responsibilities regarding the research conducted in the Gwich'in Settlement Region. In Nunavut, the Nunavut Research Institute (NRI) has also developed a licensing process and ethical guidelines regarding research conducted. The NRI issues research licenses and they administer the *Scientists Act* (R.S.N.W.T. 1988 c.S-4). This act requires prior informed consent from communities before research can commence. This promotes communication between researchers and communities, recognition of traditional knowledge, and research that is beneficial to communities (Ford, 2005a).

The Inuvialuit Land Claims Area: Within the Inuit region of the western Arctic, a national park has been established on Banks Island. Within the agreements for the establishment of this national park, traditional knowledge is being applied. The agreements provide that the Canadian Parks Service shall consult with the Inuvialuit Regional Council for the approval of archaeological research permits and for the recording and documentation of traditional knowledge. The Canadian Parks Service shall record and document Inuvialuit traditional knowledge of the natural and cultural resources in eth Park as reasonably possible following the signing of these agreements. These agreements shall also make available any traditional knowledge research information available to Inuit. (Text on the Inuvialuit Land Claims Area from "Legislative Measures and Canadian Arctic: The Investigation of Status and Trends of Traditional Biodiversity Related Knowledge in the Arctic Regions" by Violet Ford 2005.)

Case study: Development of the Kaska Traditional Knowledge Network (KTKN) - Kaska Nation, Canada.

Background: The Kaska traditional territory encompasses some 93,000 square miles stretching from northwestern British Columbia through the southeast Yukon and into the adjacent parts of the Northwest Territories, Canada. Three regional groups represent the Kaska, one in British Columbia,

the Kaska Dena Council, and two in the Yukon, The Ross River Dena Council and Liard First Nation. The Kaska view themselves as one nation, the Kaska Nation.

The Kaska assert a reciprocal responsibility to preserve, protect and maintain Kaska Traditional Knowledge (KTK) within their traditional territory. This assertion has allowed the Kaska to develop progressive and dynamic relationships with government departments, agencies and boards, private industry, academic institutions, and various other users. These relationships have stimulated several KTK projects that require careful consideration of the integration of traditional knowledge into the Network.

Three significant factors within the Kaska's context serve as catalysts to the development of the Network: (1) Kaska Participation in the World Intellectual Property Organization's (WIPO) Inter–Governmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC), (2) Kaska Resource Planning and (3) Pre–existing Kaska Traditional Knowledge Collections.

Kaska at the IGC: As the specialized United Nations agency responsible for the promotion of intellectual property (IP) worldwide, WIPO has faced significant questions regarding the relationship of the IP system with Indigenous knowledge. Concerns have been raised relating to the misappropriation of Indigenous knowledge by third parties, such as the unauthorized use of traditional designs, songs and dances by the entertainment and fashion industries to create works, which are then protected by IP (see WIPO, Intellectual Property Needs and Expectations of Traditional Knowledge Holders, 2001). Furthermore, holders of Indigenous knowledge have expressed a need to be better informed of the IP implications of making their Indigenous knowledge available to a wider audience (ibid.).

In particular, in 1998-1999 WIPO consulted with a wide range of stakeholders such as Indigenous peoples' communities, non-governmental organizations, governmental representatives, academics, researchers and private sector representatives to determine the IP needs and expectations of holders of Indigenous knowledge. In 2000, the WIPO General Assembly agreed to establish the ICG a unique intergovernmental body to discuss IP issues related to traditional knowledge, genetic resources, and traditional cultural expressions.

The Kaska are particularly interested in the discussions regarding databases as a form of intellectual property–based or *sui generis* protection and the "Toolkit for Managing Intellectual Property when Documenting Traditional Knowledge and Genetic Resources."

The Kaska have also closely monitored discussions regarding traditional knowledge–related databases within the Convention on Biological Diversity's Ad–Hoc Open–Ended Inter-Sessional Working Group (WG) on Article 8(j) and Related Provisions. To date, the discussion has not developed beyond general principles at the 8(j) WG. There appears to be great reluctance to rely on database traditional knowledge protection, particularly from Indigenous peoples' organizations from developing countries.

Kaska resource planning: The Kaska have been successful in their Aboriginal–rights based approach to protecting their knowledge, particularly as it applies to integrating traditional knowledge as a substantive component of natural/biological resource planning. The Kaska take the position in all negotiations, whether it is with government or industry, that their traditional knowledge related to sustainable land use must be integrated into resource management.

The Kaska signed a bilateral agreement with the government of Yukon that provides a framework for sustainable economic development in the Kaska traditional territories, while recognizing the

vital role and exercise of Kaska Aboriginal rights (Kaska, Yukon Government Sign Bilateral Agreement, Press Release May 9, 2003). The Bilateral serves as the parent agreement for negotiations in specific natural resource sectors including oil and gas, an umbrella resource planning process, and forestry resources. In both the successfully negotiated *Resource Planning Agreement* and *Kaska–Yukon Forestry Final Agreement*, the Kaska have placed collection and integration of KTK as a key component of resource planning. The memorandum of understanding (MOU) on forest management for the southeast Yukon signed by the Kaska and the Governments of Canada and Yukon establishes the Kaska Forestry Resources Stewardship Council. The Council will direct forest resource management planning and recommend forest resources guidelines and policies.

Alaska Highway Pipeline Project: In January 2005, Kaska and Foothills Pipe Lines Ltd. completed negotiations of a Traditional Knowledge Protocol. The Protocol is a component of the Kaska–Foothills Agreement–in–Principle signed in January 2004. Highlights of the Protocol include:

- Recognition of the role of Kaska Elders in decision–making related to TK projects
- Affirmation of Kaska ownership rights over their TK, including IP rights
- Acknowledgment that the prior informed consent of the Kaska must be obtained prior to access to traditional knowledge
- Collection and storage of KTK inventory in an electronic database
- A Workplan that sets out a detailed process of appropriate integration of KTK into the environmental planning process

Pre–existing Kaska traditional knowledge collections: The Kaska have been extensively involved in a number of traditional knowledge projects for a wide variety of purposes ranging from land selection negotiations for comprehensive claims, identification of fisheries resources, migration of regional caribou herds, environmental reclamation of mine sites and academic interest in the Kaska sustainable development within their territory. Fortunately and sadly, these pre–existing signify generations of KTK that is being lost by the passing of traditional knowledge–holders.

The initial consultative process:
The catalysts have accelerated discussions within Kaska communities on mechanisms that will preserve, protect and maintain KTK in a manner consistent with Kaska traditional governance. The prospect of developing an internet–enabled Kaska Traditional Knowledge Network was first introduced at a Kaska Nation leadership retreat where the Kaska met with consultants who provided an alpha–version presentation of the KTKN. The leaders discussed ideas and identified the following preliminary objectives of such a Network:

- Identify and implement a solution that enables the appropriate collection and secure protection of KTK
- Enable and empower the Kaska Nation with a practical instrument that will facilitate its broader initiatives in sustainable development and resource planning
- Provide a solution for the use by Kaska youth to improve awareness and appreciation for KTK, and help to close the generation gap
- Provide a solution that can enhance future e–government functionality enabling efficient and effective management of Kaska affairs (ICT Development Group, 2003).

A beta version of the KTKN was developed for internal and external consultative purposes and was developed through a Kaska–ICTG working group that focussed on the broader education, resource planning and e–governance aspects that were disclosed from preliminary discussions.

Internal Kaska Nation consultations were held regarding the beta version in all five Kaska communities and raised a number of initial concerns, including the following:

- Individual vs. collective ownership of regionally–specific KTK
- Central vs. community–centred storage of traditional knowledge collections
- Appropriate security measures for internet–enabled database
- Access of Kaska Dena members to the internet given remoteness of Kaska communities in some circumstances
- Funding of a project given such a broad mandate
- Appropriate collection of KTK from knowledge–holders
- Role of Elder's committees in governing the Network
- Static nature of electronic collection/integration
- Recognition and affirmation by all Kaska communities that KTK is collectively owned by the Kaska Nation
- Kaska customary law as the basis of control, management and access to the Network
- Extensive community consultation is integral to setting agendas and terms for inclusion of KTK
- KTK–holders have a critical role in the architecture of the KTKN

Key preliminary issues: During the consultations, a number of participants, including traditional knowledge–holders raised concerns about national ownership of all KTK. The initial consideration of this issue has lead to the possibility of having both community-based ownership and a national ownership. In this model, Kaska community committees would determine which, if any, traditional knowledge is nationally-oriented and should be shared among all Kaska communities and which information will be controlled at the community-level. There was also concern over a central database and the loss of control of region-specific traditional knowledge. This concern has both a practical and political aspect.

In each community, the issue of appropriate security measures for an internet-enabled database was raised. Participants were concerned that traditional knowledge of a private and confidential nature among the Kaska would be shared without any restriction to the general public. In response to this concern, the participants were informed of the plan to integrate strict security protocols and specific technology to ensure the confidentiality of all traditional knowledge stored in the database. A legal aspect of this security issue is that the current intellectual property regime does not adequately protect the content of databases for the Kaska Nation's purposes. Not only does the law not protect content, it may not recognize the Kaska First Nations as legal owners of such traditional knowledge, thereby leaving any accessed information on the Network vulnerable to misappropriation. At this point, the only two options for protection will be contractual arrangements and simply maintaining a closed database.

Participants in all communities were concerned with appropriate collection of KTK, particularly in avoiding the misappropriation that has historically occurred on too many occasions. The participants were informed that all information would be collected in a manner that was consistent with and respectful of Kaska customary law.

Many participants, particularly KTK-holders, were adamant that Elder's Committees have clear role in the design, control and management of the Network. In addition, Kaska leaders

acknowledged the importance of traditional knowledge-holders in the architecture of the Network. The overall traditional knowledge governance model of the Kaska has traditional knowledge-holders as key decision-makers in the process.

The Network, like the content it protects, preserves, and maintains, will remain dynamic. The Network will evolve to meet the needs of the Kaska Dena. The Kaska communities must be invested and informed in the TK collection process for it to be successful. In this sense, the prior informed consent must not only occur at the beginning of this project, but it must necessarily occur throughout the continuing development of the Network among the Kaska Dena.

Traditional Knowledge databases may be a tool that has as much promise as it does peril. We must also be mindful of the underlying purposes of TK protocols by Indigenous peoples, protection, preservation and maintenance of their sacred knowledge. If we are not thoughtful, knowledge may be exploited and the consent to and participation in similar processes will be less likely in the future. If we are thoughtful, a best practice may be established that will have application far beyond the Kaska traditional territories. (Case study from "Kaska Nation: Development of a Traditional Knowledge Network – Empowerment by Knowledge" by Merle Alexander 2005.)

4.2.7 Reintroduction of skills, knowledge and practices

It seems that traditional knowledge and values have not fully been a central part of the development process of the **modern Greenlandic society** (Sejersen 2004). However, since the end of 1990s serious efforts have been made by different stakeholders, for instance by the Home Rule, to integrate traditional local knowledge in the decision-making regarding resource management (ibid., p. 48). Also, the biologists who are used as experts by Home Rule have started to take into consideration the local knowledge. The road towards the empowerment of local Inuit knowledge and practices is not an easy one and there are still many obstacles connected to this issue. Many hunters feel overlooked by Greenlandic administration (ibid., p. 33) and regulations and they feel that biologists with their research methods are too detached from a daily subsistence life of local Inuit (ibid., pp. 38-44). The Inuit Institute/Ilisimatusarfik in Nuuk became university in 1987. Ilisimatusarfik promotes modern education based on Inuit traditions.

Sami Allaskuvla in Kautokeino, **Norway** teaches traditions and educates Sami to be part of the modern society. The Sami Educational Centre in Inari, **Finland** promotes maintenance of Sami traditional knowledge within its area. The Centre provides a study program on North Sami language and Sami traditional knowledge and education in reindeer herding (Sámi Oahpahusguovddás, www.sogsakk.fi). Many municipalities and local communities arrange "know-how" - courses and lectures in how to prepare reindeer skin, how to make boats and sledges, how to gather herbs, and so forth. In addition, many books, videos, TV-programs and other modern material are produced to support those who are interested in traditions and related knowledge. **Sami of Kola Peninsula** have many projects, partly financed by the western money, with the aim to take back their language, subsistence activities and traditions.

Canada: Inuit women from the **Belcher Islands of Hudson Bay** make traditional baskets of lyme-grass. Some **Inuit** women living in Sanikiluaq recall vaguely older women making baskets in the later 1950s and 1960s (Kowan 2002). Nunavut Arctic College arranged in the 1990s a basket course for fifteen women; six of these women continue working with baskets. To start with, the most of the women had very vague memory of basket making. The women believe that the knowledge of basket making existed among the women "in the form of cultural memory." The knowledge was not directly transferred from Elders to the younger generation. Instead, the participants of the basket course had to make research on basket making while producing baskets. As they discussed and worked their "fingers started to remember" (Kowan 2002, p. 180-182). External teachers were not used. These women also learned new language skills by producing business cards and other texts and making economic calculations. The Sanikiluaq basket project strengthened women's latent skills providing them with knowledge that is used

in the economic life of their community.

When developing projects and courses with the aim to reintroduce Indigenous skills and strengthening the local knowledge base different approaches are used. Karen Erickson et.al., (2002) introduced an "appreciative" approach that goes beyond participation when talking about community development. The appreciative inquiry builds upon "what is," ie., the capacity of villages rather than on expertise from outside. "The state of dependency is arguably the single, most damaging, force in undermining Native self-esteem" (ibid. p. 165). 'Building from Strength' is a project in the **North American Arctic** that intends to let "local people speak and act themselves," and to "reaffirm their traditional values and strengths" (ibid.).

4.2.8 Indigenous customary law

Neither the common law nor international treaties place Indigenous customary law on equal footing with other sources of law. As a result, the traditional knowledge of Indigenous peoples is particularly vulnerable to continued destruction without substantive legal protection. Generally, the Courts have treated Indigenous customary law as subservient, static, primitive and dichotomous to Western sources.

In recent years, we have seen remarkable international development towards mechanisms to "reconcile" Indigenous legal perspectives with Western counterparts as it applies to the protection of Indigenous traditional knowledge (Indigenous knowledge). Canada has been at the forefront of these international discussions and, to its credit, one of the most engaged States. Indigenous peoples' organizations have vehemently argued for equal affirmation of the Indigenous body of law that applies to the regulation of their practices, customs and traditions. It is argued here that Indigenous peoples have an opportunity to lead the development of a *sui generis* approach to protecting Indigenous knowledge.

Indigenous knowledge and Indigenous customary law
Indigenous customary law, like other sources of law, is dynamic by its very nature. It is not frozen in time, it has evolved with the social development of Indigenous peoples. Indigenous customary law also has an inextricable communal nature, the social structures that recreate, exercise and transmit this law through generations, and the protocols that govern these processes, are deeply rooted in the traditional territories of Indigenous peoples, and, understandably are inalienable from the land and environment itself. It is often noted that Indigenous customary law is inseparable from Indigenous knowledge. This may not be precise; often the law and knowledge are one in the same. In some Indigenous Nations, the abstract subtlety of Indigenous customary law is indivisible from cultural expressions such as stories, designs and songs. That is, a story may have an underlying principle of environmental law or natural resource planning (Borrows, 2002 pp. 17–20, for an interpretation of an Anishinabek resource law regarding *Nanabush v. Deer, Wolf* et al.).

Some Native legal scholars have reinterpreted stories in a common law context to demonstrate this inseparability (ibid.) One of the most pre–eminent of such scholars, Dr. John Borrows, explains Indigenous customary law as follows:

> Regardless of the form of First Nation stories… they function together to guide people in the resolution of disputes. Indigenous peoples frequently access their historic experiences and cultural epics in order to formulate and apply their own law. The stories are flexible enough to be applied as answers to different questions. They often contain multiple meanings and their deceptive simplicity hides a sophisticated structure and substance… My retelling of… stories demonstrates that the most important messages in First Nations stories may be the least obvious in the first hearing. The speaker may even intentionally bury the primary motivation in relating a story to deflect its directness and thereby avoid outright confrontation. Clearly, this path to judgment leaves much to an individual's analytical reflections and contains a very different understanding of legal reasoning

> from that most familiar to Canadian Courts… Yet, such intellectually challenging work is found in all legal reasoning processes. Answers to tough legal questions are not formulaic or self–evident; they require hard choices concerning the appropriate inferences to be drawn from the facts and cases in any dispute (Borrows, 2002, p. 21).

This above statement articulates the dynamics between Indigenous knowledge and Indigenous customary law and its constant recreation. It also highlights an important point that is frequently gleaned over, Indigenous knowledge has substantial purpose and guidance that must be reflected upon, the simplicity of its expression commonly incorporates Indigenous customary legal concepts, guidelines and principles. Like any source of law, reflection and interpretation is seldom evident upon first hearing or reading.

This final point regarding the similarities between Indigenous and non–Indigenous legal interpretation needs further assessment and integration. More effort must be devoted to understanding how these two legal paths run in parallel, in the same direction and intersect. Dr. Borrows is instructive on highlighting the similarities and differences between the common law and Indigenous customary law as follows:

> Indigenous traditions and stories are both similar to and different from case law precedent. They are analogous to precedent because they attempt to provide reasons for, and reinforce consensus about, broad principles and to justify or criticize certain deviations from generally accepted standards. Common law cases and Aboriginal stories are also similar because both record the fact patterns of past disputes and their related solutions. Furthermore, both… are interpreted by knowledgeable keepers of wisdom and presented in a manner suitable to a particular dilemma. Finally, both… are regarded as authoritative by their listeners, and there are natural, moral, and cultural sanctions for the violation of their instructions. The interpretation of these stories encourages a basic personal and institutional adherence to underlying values and principles. Each of there factors permits First Nations to look upon their stories as a body of knowledge that fulfils many of the same functions as common law precedent (Borrows, 2002, p. 14).

Such above analysis will further the parallel and complementary conceptual understandings that will be required for Indigenous customary law and Western law to be jointly interpreted. Moving beyond a "conflicts of law" approach and reconciling upon a manner to read our laws together will allow equitable progress. The difficulties are at this point: creating a true validation and affirmation process, and learning to incorporate both perspectives into a mutual understanding.

Current state of domestic mechanisms for Indigenous knowledge protection

It seems that governments of Canada (federal, provincial or territorial) have not clearly claimed jurisdiction or ownership over Indigenous knowledge in any public statement, policy or legislation. There appears to be implied recognition that Indigenous peoples have control and management of their Indigenous knowledge, but there is no clear affirmation that Indigenous knowledge is a Native right under section 35(1) of the *Constitution Act*, 1982.

The Government of Canada has approached Indigenous knowledge from both a self–government and conventional means perspective. Canada is willing to negotiate Indigenous knowledge as an implicit subject matter of self–government negotiations. Canada also advocates protection and management of Indigenous knowledge. As for the self–government jurisdiction, Canada's most recent position on subject areas it is willing to negotiate jurisdiction for is set out in the 2003 publication, "Resolving Aboriginal Claims – a Practical Guide to Canadian Experiences" as follows:

> First Nation laws will, for the most part, be focussed on matters that are internal to a First Nation and integral to its culture. Clarity and harmony between the First Nation, federal and provincial jurisdictions will be established through detailed, clear and precise definitions of First Nation law

making power, and the inclusion of rules of priority to deal with conflicts (Indian and Northern Affairs Canada, 2003 p. 32).

Self–Government Aspects Considered Integral to Aboriginal Peoples and Essential to Their Operations as a Government:

- Aboriginal languages, culture and religions;
- Education;
- Health; …
- Agriculture. (ibid.) [list edited for relevance]

Aspects Considered to be Beyond Those Integral and Internal to Aboriginal Peoples but for Which the Canadian Government Would be Willing to Negotiate Some Measure of Jurisdiction or Authority:

- Administration and enforcement of laws of other jurisdictions,
- Environmental protection, assessment and pollution prevention,
- Fisheries and migratory birds co–management…(ibid.) [list edited for relevance]

The above excerpt touches upon the broad nature of Indigenous knowledge and identifies some jurisdictional areas where Indigenous knowledge most commonly arises. Whether it is in the broadest spiritual understandings, traditional medicines or integration of Indigenous knowledge on equal terms with western science within environmental assessment processes, (see *Canadian Environmental Protection Act*, 1999 c. 33) there is implied recognition that Indigenous peoples have authority to ownership, control and custody of their knowledge.

As for conventional practice, Canada has emphasized options that do not require substantive self–government negotiations; namely contracts, resource management agreements and intellectual property law. In "Resolving Aboriginal Claims," Canada states the following with respect to Indigenous knowledge:

> Canada takes the position that there can be indirect protection of Aboriginal traditional knowledge through the designation of certain sites as protected, or through arrangements for resource management. In addition, intellectual property can be protected through conventional copyright/patent laws (Indian and Northern Affairs Canada, 2003 p. 28).

Generally, this approach advocates for the *status quo*. In many jurisdictions, sacred or heritage sites are capable of being protected by heritage conservation legislation (see *Ontario Heritage Act*, R.S.O. 1990, c. 0.18, *Heritage Conservation Act*, RSBC 1996 Chapter 187). Co–management is a common model for resource planning, particularly in parks and protected areas (examples include Gwaii Haanas National Park Reserve/Haida Heritage Site, Champagne-Aishihik First Nation and Kluane National Park Reserve). By using a legal entity or representative as an owner of Indigenous knowledge, Indigenous groups can to a limited extent use existing intellectual property law. Considering that neither the federal, territorial nor provincial governments are occupying the legislative jurisdiction with respect to Indigenous knowledge, it is suitable that Indigenous groups exercise their customary legal rights and develop *sui generis* laws that adequately protect, preserve and maintain this knowledge.

The domestic basis – judicial commentary and domestic reconciliation

> I propose to summarize. The … [Indigenous] peoples had rights of self–government and self–regulation… at the time of sovereignty. Those rights rested on the customs, traditions and practices of those peoples to the extent that they formed an integral part of their distinctive cultures. The assertion of British Sovereignty only took away such rights as were inconsistent with the concept of British Sovereignty. The introduction of English Law… was only an introduction of such laws as were not from local circumstances inapplicable. The existence of a body of… [Indigenous]

> customary law would be expected to render much of the newly introduced English Law inapplicable to the… [Indigenous] peoples, particularly since none of the institutions of English Law were unavailable to them in their territory, so that their local circumstances would tend to have required the continuation of their own laws. The division of powers brought about [by] Confederation… would not, in my opinion, have made any difference to… [Indigenous] customary laws. Since [Confederation], Provincial laws of general application would apply to the… [Indigenous] people, and Federal laws, particularly the *Indian Act*, would also have applied to them. But to the extent that… [Indigenous] customary law lay at the core of their "Indianness", that law would not be abrogated by Provincial laws of general application nor by Federal laws, unless those Federal laws demonstrated a clear and plain intention of the Sovereign power in Parliament to abrogate the… [Indigenous] customary laws. Subject to those over–riding considerations… [Indigenous] customary laws of self–government and self–regulation have continued to the present day and are now constitutionally protected by s.35 of the *Constitution Act*, 1982 (*Casimel et al. v. Insurance Corp. of British Columbia*, 106 D.L.R. (4th) 720 at para. 23 quoting Lambert J.A. in *Delgamuukw v. BC* (1993), 104 D.L.R. (4th) 470 p. 730).

The above lengthy cite traces in favourable detail the continuing legal relationship between Indigenous customary law, assertion of Crown sovereignty and the co–existence of Indigenous legal regimes in the Canadian constitutional context. Most importantly, the Lambert J.A. explicitly states that Indigenous customary law is neither abrogated nor derogated by provincial, territorial or federal law unless there is "clear and plain" intention of the sovereign power by act of Parliament or legislature. As we have discussed above, Canada has not legislative exercised such an extinguishment power. Therefore, Indigenous customary law, as it applies to the preservation, protection and maintenance of Indigenous knowledge, continues in the present day and is now protected by section 35 of the *Constitution Act*, 1982. To the extent that it has been elaborated or articulated by modern–day treaty provisions this is expressly recognized and affirmed protection by the Constitution.

The pre-existing and contemporary status of Indigenous law was made very plain by the Supreme Court of Canada in Mitchell v. M.N.R (*Mitchell v. M.N.R.*, 2001, 1 S.C.R. 911). In declaring the source of Indigenous rights, Chief Justice McLachlin wrote, "English law… accepted that the Aboriginal peoples possessed pre-existing laws and interests, and recognized their continuation…" As such, she held, "[A]boriginal interests and customary laws were presumed to survive the assertion of sovereignty, and were absorbed into the common law as rights." McLachlin C.J.'s declaration that Indigenous laws secured the protection of the common law following the assertion of sovereignty by the Crown demonstrates why Indigenous laws may be held to exist despite the intervention of foreign (non–Indigenous) legal systems (Borrows, 2002, p. 11).

In short, European settlement did not terminate the rights of Indigenous peoples arising from their historical occupation of their lands and their prior social organization and distinctive cultures on that land.

When the rights in issue are rights in relation to the social organization of the Indigenous people in question, such as rights arising from marriage, inheritance, adoption and, we would add, rights arising from Indigenous knowledge, no judicial declaration is required to permit internal self–regulation in accordance with Indigenous traditions, if the people affected are in agreement. But, if any conflict between the exercise of such Indigenous traditions and any law of the Province or Canada should arise the question can be litigated (*Casimel et al. v. Insurance Corp. of British Columbia*).

Canadian courts have also explicitly recognized the substantive role that Indigenous customary law plays in developing the Indigenous perspective of an Indigenous right in issue. On this issue, the Supreme Court of Canada in Van der Peet said as follows:

> In assessing a claim for the existence of an Aboriginal right, a court must take into account the perspective of the Aboriginal people claiming the right. Sparrow… held… that it is "crucial to be sensitive to the Aboriginal perspective itself on the meaning of the rights at stake." It must also be recognized, however, that that perspective must be framed in terms cognizable to the Canadian legal and constitutional structure. As has already been noted, one of the fundamental purposes of s. 35(1) is the reconciliation of the pre–existence of distinctive Aboriginal societies with the assertion of Crown sovereignty. Courts adjudicating Aboriginal rights claims must, therefore, be sensitive to the Aboriginal perspective, but they must also be aware that Aboriginal rights exist within the general legal system of Canada. To quote Walters: "a morally and politically defensible conception of Aboriginal rights will incorporate both [Aboriginal and non–Aboriginal] legal perspectives". The definition of an Aboriginal right must, if it is truly to reconcile the prior occupation of Canadian territory by Aboriginal peoples with the assertion of Crown sovereignty over that territory, take into account the Aboriginal perspective, yet do so in terms which are cognizable to the non–Aboriginal legal system (*R. v. Van Der Peet*, [1996] 2 S.C.R. 507, 137 D.L.R. (4th), para. 49).

Also, in *Delgamuukw* the Supreme Court of Canada further elaborated on the role of Native legal perspectives, where Chief Justice Lamer, as he then was, stated the following:

> In *Van der Peet*… I held… that the reconciliation of the prior occupation of North America by Aboriginal peoples with the assertion of Crown sovereignty required that account be taken of the "Aboriginal perspective while at the same time taking into account the perspective of the common law" and that "[t]rue reconciliation will, equally, place weight on each". I also held that the Aboriginal perspective on the occupation of their lands can be gleaned… from their traditional laws, because those laws were elements of the practices, customs and traditions of Aboriginal peoples... As a result, if, at the time of sovereignty, an Aboriginal society had laws in relation to land, those laws would be relevant to establishing the occupation of lands, which are the subject of a claim for Aboriginal title. Relevant laws might include, but are not limited to, a land tenure system or laws governing land use (*Delgamuukw v. BC*, [1997] 3 S.C.R. 1010, para. 148).

Both quotes from *Van der Peet* and *Delgamuukw* properly highlight the equality of Indigenous and non–Indigenous perspectives on the nature of the right being claimed with particular emphasis on the treatment of Indigenous "traditional laws." Given the above section tracing the continuing co–existence and recognition by the common law (and now s.35 of the *Constitution Act, 1982*) of Indigenous customary laws, it is evident that this provides a significant legal basis that any regime that seeks to protect, preserve and maintain Indigenous knowledge must necessarily place equal emphasis on both Indigenous and non–Indigenous sources of law.

It is important to note that although there is strong support for the role of Indigenous customary law in the characterization and elaboration of an Indigenous right, the primary question remains whether the reconciliation process will prove favourable to Indigenous peoples. To date, the Courts have not treated Indigenous perspectives equally. Although the Courts have stated as a legal principle that Indigenous customary law be treated equally, judges have not adopted this principle in application. Professor Borrows highlights this problem as follows:

> [T]he court did not address the very real danger that Aboriginal law may be mischaracterized in order to make it 'fit' the common law system. Moreover, there is little mention of ways in which the common law may have to be reframed to preserve the underlying context and reason for the existence of a particular legal principle with an Aboriginal community (Borrows, 2002, p. 62). The court nonetheless reasoned that its approach best reconciles the prior occupation of Canada with Crown sovereignty, because it bridges two legal perspectives. One would have liked to see more discussion of how each system would have to change to accommodate the other, and a real engagement of the types of considerations… Regrettably, the court [has] not take[n] up these

question in subsequent decisions… (Borrows, 2002, p. 62).

The challenge of finding a truly equitable reconciliation between Indigenous and non–Indigenous perspective in designing a *sui generis* approach domestically will be taking policy and legislation beyond the narrow construction of case law. To our knowledge, there remains no specific judicial consideration of Indigenous knowledge as the focal point of an Aboriginal rights claim. We are faced with a significant but not insurmountable challenge to strike an equitable balance in seemingly uncharted territory. Indigenous customary law is flexible: it reinvents itself to fit the appropriate context.

International arenas

International endeavours to protect TK as a distinct, *sui generis* form of IP confront a deep paradox: how to give broader, even global meaning and effect to norms and knowledge systems that are intrinsically and irreducibly local in character, and that rely on the original community context for their full significance, without eliminating the essential qualities of TK. Too strong and pre-emptive an international *sui generis* model for IP protection may homogenize TK: (Taubman, 2005)

> Any attempt to devise uniform guidelines for the recognition and protection of Indigenous peoples' knowledge runs the risk of collapsing this rich jurisprudential diversity into a single 'model' that will not fit the values, conceptions or laws of any Indigenous society (ibid.).

The diversity of the very subject matter of TK and of its customary modes of protection may require, instead, a *suorum genorum* framework – an heterogeneous network of mutual recognition that does not confine TK into one distinct genus, but recognizes that divergent knowledge traditions, integrated with customary law, warrant recognition as distinct genera, under the *aegis* of a general set of core principles (ibid.).

International attempts to establish *sui generis* protection for Indigenous knowledge are at an impasse or crossroads.

The debate has settled on a single decision – should an international regime be binding or non–binding. The line is generally drawn between the developed and developing nations. As Indigenous people are not considered to represent Nation–States, they are influential, necessary but are not empowered to make the decision themselves. There is reason for cautious optimism if Indigenous peoples are capable and willing to take the lead in ensuring the affirmation of Indigenous customary law's role in protecting Indigenous knowledge.

CBD and customary law: The Convention on Biological Diversity (CBD) is only second to the Permanent Forum on Indigenous Issues in its proactive inclusion of the perspectives of Indigenous peoples. There are two developing areas of the CBD that Indigenous knowledge and Indigenous customary law will play an important role in the two key Working Groups, Article 8(j) and Related Provisions (8(j) WG) and the Access and Benefit Sharing to Genetic Resources and Associate Traditional Knowledge (ABS WG).

Article 8(j) Working Group: At the Fourth Meeting of Conference of the Parties (COP) of the CBD (COP 4), the Parties established the 8(j) WG to address the implementation of Article 8 (j) and related provisions. Providing advice with respect to the application and development of legal and other appropriate forms of protection of Indigenous knowledge is a priority item of the 8(j) WG (see decision IV/9, paragraph 1).

At COP 5, the 8(j) WG was tasked with the elaboration of a number of sets of guidelines, including: Guidelines for the development of mechanisms, legislation or other initiatives to ensure benefit-sharing

and prior informed consent (see decision V/16, annex, II, element 4, task 7) and standards and guidelines for the reporting and prevention of unlawful appropriation of traditional knowledge and related genetic resources (see decision V/16, annex, III, element 6, task 10).

At COP 6, the Parties requested the 8(j) WG to address the issue of *sui generis* systems for the protection of traditional knowledge and identified the following issues on which to focus:

> Compiling and assessing existing Indigenous, local, national and regional *sui generis* systems;
>
> Studying existing systems for handling and managing innovations at the local level and their relation to existing national and international systems of intellectual property rights, with a view to ensure their complementarity;
>
> Assessing the need for further work on such systems at the local, national, regional and international levels;
>
> Identifying the main elements to be taken into consideration in the development of *sui generis* systems;
>
> The equitable sharing of benefits arising from the utilization of traditional knowledge, innovations and practices of Indigenous and local communities, taking into account the work carried out by the Intergovernmental Committee Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore with a view to promote mutual supportiveness, and existing regional, sub–regional, national and local initiatives (see decision VI/10, paragraph 34).

At COP7, the Parties clarified previous decisions and held that the most appropriate means of protecting Indigenous knowledge is "based on a combination of appropriate approaches… including the use of existing intellectual property mechanisms, *sui generis* systems, customary law, the use of contractual arrangements, registers of traditional knowledge, and guidelines and codes of practice" (see CBD COP Decision VI/10A, para. 33). More particularly, the 8(j) WG has a working draft of potential components of a *sui generis* system for the protection of Indigenous knowledge, which include:

- Clarity with regard to ownership of traditional knowledge associated with biological and genetic resources.
- Recognition of elements of customary law relevant to the conservation and sustainable use of biological diversity with respect to: (i) customary rights in Indigenous/traditional/local knowledge; (ii) customary rights regarding biological resources; and (iii) customary procedures governing access to and consent to use traditional knowledge, biological and genetic resources.
- A process and set of requirements governing prior informed consent, mutually agreed terms and equitable sharing of benefits with respect to traditional knowledge, innovations and practices associated with genetic resources and relevant for the conservation and sustainable use of biological diversity.
- Provisions regarding enforcement and remedies.
- Relationship to other laws, including international law.
- Extra-territorial protections. (See UNEP/CBD/COP/7/21, H. *Annex*, paras. 2, 4, 5, 10, 11 and 12).

The potential components mark a critical advancement in the work of the 8(j) WG, particularly its concrete inclusion of the role of Indigenous customary law in protecting Indigenous knowledge. The fourth meeting of the 8(j) WG will: (1) Consider non-intellectual-property-based *sui generis* forms of protection of Indigenous knowledge; (2) further develop, as a priority issue, elements for *sui generis* systems for Indigenous knowledge protection, (3) Review and make recommendations regarding the

international regime on access and benefit-sharing with a view to including *sui generis* systems and measures for the protection of Indigenous knowledge; and (4) Explore, taking into account the work of the WIPO IGC, the potential of and conditions under which the use of existing as well as new forms of intellectual property.

ABS Working Group: The COP began to tangibly address benefit-sharing issues, and their implementation at COP-4. The "access" component of the issue was identified for detailed priority attention at COP-5, and the concept of "benefit-sharing" was similarly addressed at COP-6. Intersessionally, since COP-4, the Parties gave significant attention to access and benefit-sharing (ABS) issues, specifically addressing them in:

- A meeting of the Intersessional Organizing Committee (ISOC, Montreal, 1999);
- Two meetings of the Panel of Experts on ABS (San Jose, 1999 and Montreal, 2001);
- SBSTTA 5; and
- An ABS WG (Bonn, 2001)

Most important, however, was the October 2001 meeting of the ABS WG. In the outputs of that meeting, the parties synthesized the prior work, developing a series of recommendations into the Bonn Guidelines, which were adopted at COP-6 (Decision VI/24). COP6 in its decision VI/24 also adopted other related provisions regarding incentives, capacity-building, and Intellectual Property Rights (IPRs).

Between COP 6 and COP 7, there has been a substantive and, generally, successful movement to commence discussion and negotiation of an international regime on Access and Benefit Sharing on Genetic Resources and Associated Traditional Knowledge. This is remarkable and unprecedented to move from voluntary Guidelines to international treaty discussion in a two-year period at the international level.

Specifically, at COP 7, the Parties provided the ABS WG with a mandate to commence negotiations. This mandate includes several elements that address the inclusion of Indigenous customary law into such regime as follows:

> Elements: The following elements shall be considered by the Ad Hoc Open-ended Working Group on Access and Benefit-sharing for inclusion in the international regime, *inter alia*:
>
> - Measures to ensure compliance with prior informed consent of Indigenous and local communities holding traditional knowledge associated with genetic resources, in accordance with Article 8(j);
> - Recognition and protection of the rights of Indigenous and local communities over their traditional knowledge associated to genetic resources subject to the national legislation of the countries where these communities are located;
> - Customary law and traditional cultural practices of Indigenous and local communities;
> - Code of ethics/Code of conduct/Models of prior informed consent or other instruments in order to ensure fair and equitable sharing of benefits with Indigenous and local communities;

The third meeting of the Ad Hoc Open-ended Working Group on Access and Benefit Sharing (ABS) of the Convention on Biological Diversity (CBD) was held from 14-18 February 2005, in Bangkok, Thailand. As mandated by COP–7, the Working Group initiated negotiations on an international regime on ABS, in accordance with the terms of reference contained in an annex to Decision VII/19 on ABS. The Working Group also addressed: the use of terms not defined in the CBD; additional approaches to complement the Bonn Guidelines on ABS, such as an international certificate of origin/source/legal

provenance; measures to ensure compliance with prior informed consent (PIC) of Parties providing genetic resources and of Indigenous peoples providing associated traditional knowledge, and with mutually agreed terms (MAT) for granting access; and options for indicators for ABS, to be used for evaluating progress in the implementation of the CBD's Strategic Plan (Earth Negotiation's Bulletin, Febuary 2005).

The meeting's discussions focused on the international ABS regime. The complexity of the matters, such as the inter–linkages with intellectual property rights (IPRs), the difficulty to develop a common vision regarding the nature of the regime or even its necessity, and the unclear international framework indicate the long road ahead. Nevertheless, many Nation–States considered the meeting a success, as a brainstorming session to allow for consolidation of country and regional positions, and to prepare for the next Working Group session. Some options were identified under the scope and potential objectives of the regime, while its potential elements were grouped according to their subject matter, to set the groundwork for more structured deliberations in the future. A matrix was also developed to identify and analyze the gaps in international instruments and indicate ways to address them. Finally, the meeting made specific calls for government submissions on the matrix and broader ABS regime, which many see as crucial to further clarify positions and set the baseline for the Working Group's fourth meeting in Spain to be held prior to the next COP in Brazil in 2006 (ibid.).

On this information, it is evident that Indigenous customary law may have a substantial role to play in the development of CBD-based international instruments. At this point, it is unclear whether there will be a stand-alone *sui generis* system advocated by the 8(j) WG that will parallel the international regime being negotiated by the ABS WG. It is our opinion that until such time as one regime develops further, the most reasonable approach is for Indigenous peoples' organizations to advocate in both Working Groups. It is clear that there is a tremendous burden and opportunity in both Working Groups to develop precedent setting recognition with respect to the role of Indigenous customary law in protecting Indigenous knowledge.

Future directions: a sui generis approach forwards

> The design of *sui generis* ways of protecting TK – protection that is tailored to fit its distinctive qualities – may also need to give effect to the original community's own approach to defining, protecting and managing the TK. In many cases, these customary systems of custodianship and intergenerational transmission are under pressure, and more effective protection of TK could mean reinforcing these systems within the community. Clarification of customary systems may also be needed where the boundary is blurred between the traditional community itself and the general population, and there is consequent uncertainty about the scope and reach of customary law. But current initiatives for IP protection of TK aim above all to create enforceable rights that have effect beyond the original community, in the broader marketplace where inappropriate commercialization of TK is more likely to occur (Taubman, 2005).

The above discussion notes an extraordinary international movement towards exploring mechanisms to "reconcile" Indigenous customary law within international instruments in the protection of Indigenous knowledge. From the onset, Canada has been among of the most engaged States in these international forums. Canadian Indigenous peoples have been among the most vocal in arguing for equal recognition and affirmation of our customary laws and this has a clear domestic legal foundation. The inquiry is, do these continuing discussions represent promise or peril?

Indigenous peoples have Indigenous customary law with respect to their knowledge that empowers them with the authority and jurisdiction to control, manage and own that knowledge. Indigenous peoples have an opportunity to lead the development of a *sui generis* approach to protecting Indigenous knowledge. In this context a *sui generis* approach is proposed, an approach that recognizes, affirms and enables Indigenous customary law in the architecture of instruments, mechanisms and measures to protect,

preserve and maintain Indigenous knowledge. This proposal is intended to be incremental and may evolve in the following manner:

1. Affirming the prerequisite of substantive participatory rights for Indigenous peoples prior to and throughout the design of instruments, mechanisms and measures, including capacity–building measures, where necessary.

2. Establishing mechanisms that empower Indigenous peoples to exercise customary rights within their national context such as:

   - Pilot project negotiations with specific Indigenous groups to facilitate Indigenous laws on Indigenous knowledge protection (i.e., self–governing First Nation with cultural heritage law–making jurisdiction);
   - Regional–based pilot projects;
   - National strategic planning sessions with national Aboriginal organizations and other innovative Indigenous groups with expertise in Indigenous knowledge protection;
   - National and/or regional Indigenous knowledge think tanks;
   - Legislative review and reform;
   - A national Indigenous knowledge policy;
   - National and/or regional *sui generis* legislation,

3. Creating international reciprocity measures that make Indigenous customary law available in foreign jurisdictions;

4. Proceeding to towards the development of harmonized minimum standards, guiding principles and overarching normative statements which may constitute an international norm–setting instrument; and

5. Advancing a legally–binding *sui generis* legally–binding instrument or instruments, as necessary, with substantive Indigenous customary law enabling components.

This development must occur at an incremental pace. One must avoid a single model approach that does not recognize the diversity among Indigenous customary legal regimes.

> This point does not advocate inactivity. Despite Canada's leadership in the CBD discussions, a concerted effort to engage Indigenous governments in developing a national strategic plan has not been promoted. There have been efforts among key individuals in government departments and agencies, and certainly, as civil servants, it is to their credit. However, Canada must take a more proactive role in nationally furthering these complex policy discussions. In this regard, it is equally necessary for national Indigenous groups to elevate this as an urgent political priority at political levels. As has been a consistent theme throughout this paper, Indigenous and non–Indigenous governments must take their steps forward as partners recognizing the equality of our legal perspectives. To paraphrase oft–quoted Indigenous law scholar, a morally and politically defensible approach to protection of Indigenous knowledge will incorporate both Indigenous and non–Indigenous legal perspectives" (Walters, 1992). One must move beyond denial that the current systems and sources of law are adequate and, only then, Indigenous customary law will form part of the current legal system. (From "Aboriginal Customary Law: Reconciling the Savage with the Civilized" by Merle Alexander 2005.)

5. Identification of global and national processes that may threaten the maintenance, preservation and application of traditional knowledge, and processes at the local community level that may threaten the maintenance, preservation and application of traditional

knowledge

5.1 Identification of global, national and local processes that may threaten the maintenance, preservation and application of traditional knowledge

5.1.1 State laws, national policies, dispossession of territories, administrative measures

The causes of threat to the maintenance of traditional knowledge are of many kinds. It may be that species and ecosystems are not protected sustainably enough. There are also many stakeholder groups with varied expectations and views regarding the biodiversity maintenance. Indigenous people may feel that they do not get support for their traditional livelihoods, knowledge and management programs.

In some Arctic areas, their rights are not strengthened to meet the competing interests regarding the land use in their areas. Furthermore, state and regional planning and decision making can take place without Indigenous involvement. Any benefits must be shared with local Indigenous groups. Also, capacity building, information sharing and scientific assistance need to be fostered when taking measures to preserve traditional knowledge and the conditions in which traditional knowledge is used and maintained. Different national and regional levels must be activated. For instance, the implementation of national legislation presupposes financial support.

Greenland-continued Danish influence: Many educated Greenlanders stay abroad and Danish people fill the posts within service sector, education and overall expertise in construction, health care, etc. Many teachers (about 25 percent) are Danes who do not command Inuit language. They have introduced "Danish-style schooling" (Petersen 1992, p. 4). The colonial condition of Greenland still exists to a certain degree in relation to Denmark or Danish influence (Jónsson 1996, Petersen 1992; Sejersen 2004). The Home Rule is organized according to the Danish organizational way and it employs many Danish people. The Danish staff has introduced Danish ideas concerning economic activities and organizational culture including the use of Danish language in administration (Petersen 1992, p. 5). Many hunters feel overlooked by Greenlandic administration (ibid., p. 33) and regulations and they feel that biologists with their research methods are too detached from a daily subsistence life of local Inuit (ibid., pp. 38-44).

Finnish Sami Parliament lacks political status: According to the *Sami Parliament Act* 974/1995, § 9, the authorities shall negotiate with the Sami Parliament on all wide-ranging measures (land use, conservation areas and wilderness areas, community planning and mining activities), which may have an influence on the status of Sami as Indigenous people. The Finnish administration however has not negotiated with Sami in all matters affecting them, in accordance with this law. Therefore, it has remained "a resolution with little real content" (Josefsen 2005, p. 183). An example that can be mentioned is in 1998 the Office of Chancellor of Justice asked Ministry of Justice to make an investigation on Sami land rights as a question on private ownership and as an issue of ratification of ILO Convention on Indigenous peoples rights. Ministry of Justice did not negotiate with Sami parliament about the investigation as law presumes (Sami Parliament Report 2003). When compared with the Sami Parliament in Norway it can be stated that the Finnish Sami Parliament has not managed to gain high political status in Finland (AHDR 2004, p. 96).

Loss of lands among Eastern Sami: The border arrangements between Finland and Russia due to the World Wars I and II lead to the division of Sami settlement areas and Sami from Petchenga, Paasjoki and Suenjel were relocated to Sevettijärvi, Nellim and Keväjärvi in Finland. The Skolt Sami lost their traditional lands and ways. Much traditional knowledge was embedded in their "old" lands, ecological features and (winter) villages (Pelto & Mosnikoff 1978, p. 195). These they had to leave behind. Adjustment to new surroundings has been difficult and has without doubt lead to the loss of many cultural features and TEK-related knowledge. In the middle of 20th century, the **Russian Sami** were removed from their traditional settlements and they became relocated to Lovozero. For instance, during 1963-1965

Sami were removed from villages Jokanga, Voronja, Varzino, Tshudzajavre, Pulozero and Tshlamny Varre to Lovozero. No work or housing was arranged for these people (Avdeeva 2000, p. 275). The change of environment and loss of contact to homelands have as consequence, for instance, that also linguistic environment and practices experience loss.

There are many problems with the practical **implementation of laws** regarding the traditional knowledge of Indigenous peoples in **Russia.** One problem with implementation stems from the declarative character of the *Federal Law Guaranteeing Indigenous Peoples' Rights in the Russian Federation* (April 30, 1999) / *Federal Law on Indigenous Peoples Rights* is that in many cases the Law does not offer mechanisms to enforce Indigenous rights - such as the right to traditional knowledge - but only gives a statement of principles. Therefore, these rights, though guaranteed in the law, are not enforced.

Secondly, conflicts between the authorities of Indigenous peoples and government bodies frequently mean that no legal regime can be established to guarantee Indigenous peoples' rights and protect their interests. In addition, the functions of authorities of federal, regional, sub-regional and local administrations are often duplicated. In addition, new legislative measures on Indigenous peoples' rights often guarantee rights that are already guaranteed as common rights to all Russian citizens.

The *Federal Law Guaranteeing Indigenous Peoples' Rights* guarantees Indigenous peoples or their representatives the right to participate in projects in terms of ecological expertise. However, this right is already guaranteed to every citizen of the Russian Federation by the *Federal Law on Ecological Expertise*. There is no reason to legislate again specifically for Indigenous peoples, as this simply duplicates the existing law. However, the real problem is that though guaranteed, the right of Indigenous peoples to contribute ecological expertise is not ensured. They are allowed to participate in discussion and to express their opinion, but they cannot influence the final decisions, because the latter are made by federal, regional or local administrations.

The extent of the authority of federal and local administrations in decision-making on TTUNs (Territories of Traditional Use of Nature) is not clear. One of the challenges for the definition of TTUNs is that their boundaries are not always concurrent with those of self-governing territories, districts, and regions; sometimes these boundaries even cross national borders. According to the Russian Federation Constitution, when a local TTUN crosses the boundaries of several self-governing territories, the decision on the TTUN should be made by the administrations of the territories involved. Similarly, the decision on a TTUN that crosses regional boundaries should be taken by the regional administrations. No decision is offered by the federal law in a case where two or more countries host one TTUN. For example, the Inuits live in the territories of four countries – Russia, the USA (Alaska), Canada, and Greenland. The issues of land and natural resource conservation on such territories, challenged by the national interests, laws, policies, and plans, might be settled through bilateral or multi-lateral international agreements.

In order for the Law on TTUNs and other legislative acts on traditional knowledge practices to be applied, it is necessary to determine which trades or practices can be referred to as 'traditional' and what are the criteria used to classify them as 'traditional.' For the last 200 to 300 years, Indigenous peoples traditional livelihoods and practices have changed due to the usage of new techniques and technologies, and due to the emergence of new types of natural resources use. So far, however, a list of activities which can be referred to as traditional knowledge practices has not been defined, and there are no criteria that can be used to distinguish various types of trades and practices as 'traditional.' Such criteria are also important in order to organize the taxation of Indigenous peoples' representatives leading a nomadic existence, since the incomes of Indigenous and tribal peoples of the Arctic territories engaged in traditional knowledge practices are tax-exempt (see Articles 217 and 238, Part 2 of the *Federal Tax Code*). Communities representing these tribes and Indigenous peoples but living in other regions are not mentioned in the law.

So far, the problems mentioned have not been solved; the proposed changes to the existing laws and acts

are not effective. In fact, the federal government has not yet succeeded either in the development of a clear national policy on the country's economic development or in the harmonization of the country's multinational population interests. However, in general, having passed a number of laws and acts, the Federal Government has clearly demonstrated its understanding of Indigenous peoples' problems and the government's responsibilities to protect Indigenous peoples' rights. (Russian text based on "An Assessment of the Implementation of the Russian Government's International Commitments on Traditional Forest-Related Knowledge from the Perspective of Indigenous Peoples" by Vladimir Bocharnikov, 2005a.)

5.1.2 The intellectual property rights legislation in Canada

The Intellectual property rights legislation in Canada is an indication of the legislative measures that may be seen as instruments that does not allow for the protection, preservation or maintenance of traditional knowledge:

The *Patent Act* (R.S., c. P-4): A patent is provided under a statutory right and is granted to inventors to exclude others from imitating, using or selling a product, composition, a machine or apparatus or process for commercial use during a twenty period from the filling of the patent application. A patent can also be related to any improvement to any on of these (Mann, p. 15). Patentable subject matter has to be novel and serve some type of utility. It has to produce a new result. The subject matter of many Inuit products and processes meet some need and still meeting a need today within Inuit life. The *Patent Act* is problematic. Section 28 states that the subject matter must not previously be disclosed. Section 34.1(1) state any person may file with the commission, prior art, consisting of patent, application for patents open to public inspection and printed publication that the person believes has a bearing on the patentability of any claims in an application for a patent (*Patent Act*). The patentable subject matter is a concern for Inuit. It creates problems in the sense that many of the Inuit designs cannot be patents, as it does not meet the requirement outlined under Section 2 of the Act.

An example of the failure of the *Patent Act* to respond to Inuit designs is the *Igloolik Floe Edge Boat* case (Mann). A floe edge boat is a traditional Inuit boat used to retrieve seals shot at the floe edge (the edge of the ice floe), to set fishing nets in summer, to protect possessions on sled when travelling by snowmobile on wet spring ice and to store hunting or fishing equipment. These boats were developed in the early twentieth century and were originally made of sealskins over a wooden frame (Mann, p. 17). The most peculiar and critical feature is the low sides, which ensure that on windy days the boat is not blown out to sea from the floe edge (Mann, p. 17). In the late 1980's the government sponsored the Eastern Arctic Scientific Research Centre to initiate a project to develop a floe edge boat that married the traditional design with modern materials and technologies. Fibreglass construction was chosen, which made it easier to maneuver than a wooden boat, the runners improved gliding on ice. In 1988, the Igloolik Business Association (IBA) sought to obtain a patent for the new boat. The IBA believed that the combination of traditional knowledge of the construction with modern fibreglass technology and with the design features included to achieve necessary performance levels would meet the tests of patent ability. The IBA initiated the patent process. The Canadian Patents and Developments Limited (CPDL) initiated a pre-project patent search. The results of the search noted several existing patents on boats with analogous structures. The letter concluded that it was difficult for the CPDL to distinguish inventively the new design from previous patents (Mann, p. 18). The impact of the process raised questions as to the full awareness of the IBA in dealing with patent issues and the intimidation of the intellectual property system to aboriginal peoples, due to its orientation towards western technology and science, and legalistic detail (Mann, p. 19).

Copyright: For a work to be protected by copyright, it must be original and contain an expression of the author's creativity. Copyright protects expressions but not ideas, procedures, processes, systems, and methods of operation, concepts, principles, or discoveries. The copyright holder's rights include the economic rights to reproduce, create derivatives, distribute, display, perform, and alter the work (Steiner,

1998). The *Copyright Act* (R.S.1985,c.C-46) provides the legal framework within which creators and other rights holders are entitled to recognition and control of and payment for the use of their works. Examples of works protected by copyright are films, novels, songs, information products and computer programs. Copyright establishes the economic and moral rights of creators and other rights holders to control the publication and commercial exploitation of their works protect the integrity of their endeavours and ensure that they are properly enumerated. For example, the sewing technique of the amauti would not be protected. A non-Indigenous artist without a breach of copyright can use the style of the amauti. Protection is of limited duration, the author's life plus 50 years. Therefore, the Inukshuk for example, which have been on Inuit lands for thousands of years, would be exempt from copyright protection. Copyright can only be for original works. This is a difficult test for Inuit when the symbols have originated across the arctic and have survived over thousands of years. In addition, copyright can only be invested in an individual. This creates difficulties for Inuit where their arts, symbols, songs, and dances are part of a community right. As it stands now, the copyright legislation covers only the expression of the ideas in a particular work and does not include the ideas that are conveyed in the substance of the work. The artistic styles and techniques used in producing the work are not protected.

In the author's view, copyright law as it presently stands creates the most difficulty for Inuit. By definition, copyright law places an immense burden on Indigenous communities seeking to protect their traditional knowledge (Riley, 2000, p. 177). In order to satisfy the requirements outlined under copyright law, Indigenous peoples would be forced to abandon the method of knowledge transmission that goes to the very essence of native life (Riley, 2000, p. 179). Riley goes on to say that the philosophical underpinnings of Western law ignore the stake that a group might have in particular issue, and fail to recognize a group's communal claim to continued existence (Riley, 2000, p. 180).

It is the view of the author that it would be like a second level of colonization at time when decolonization of Indigenous peoples has just started. It would be taking a step backward.

Trademarks: Trademarks are signifiers used by manufacturers and merchants to identify goods or services and to distinguish them from those of other manufacturers and merchants. A trademark may protect words, marks, designs colours, sounds, names, symbols, clothing, and buildings. Rights in a trademark generally depend on the actual use of the mark on goods that are sold in connection with the advertising or sales of service. These rights can continue indefinitely and as long as the mark is neither abandoned nor improperly used, so as to become generic.

Trademark may be of some benefit to some aspects of Inuit intellectual property protection in the sense that the threat of legal action can act as a deterrent against imitation or passing off of Inuit art. Trademarks have also been used as an effective means of enabling consumers to judge the authenticity of a product. However, the benefit does not extend beyond that of Inuit art. It does not apply to the protection of confidential information, knowledge or practices. The *Trade Marks Act* (R.S., c.T-10) Section 9(1) (i) is problematic. Section 9(1) states "No person shall adopt in connection with a business, as a trademark or otherwise, any mark consisting of, or so nearly resembling as to be likely to be mistaken for,

Any territorial or civic flag or any national, territorial or civic arms, crest or emblem, of a country of the Union, if the flag, arms, crest or emblem is on list"

This is problematic for Inuit in Nunavut for example where the territorial flag's emblem is the Inukshuk. Section 10 is problematic. This section provides the following:

> Where any mark has by ordinary and bona fide commercial usage become recognized in Canada as designating the kind, quality, destination, value, place of origin or date of any wares or services, no person shall adopt is as a trademark in association with such wares or services or others of the same

> general class or use it in way likely to mislead, nor shall any person so adopt or use any mark so nearly resembling that mark is to be likely to be mistaken therefore.

Even though this usage of Inuit symbols is recognized in Canada as that of Inuit origin the Inuit themselves cannot trademark their own products. According to the word of this section, a body-representing Inuit cannot trademark it on behalf of Inuit artisans, as the potential for misleading the consumer or the public that it is the body where the mark originates.

Section 11.12 is another problematic area. This section pertains to geographic indicators. It could be argued that the Inukshuk is a geographic indicator. Its origins are from the Arctic and are part of the culture of the Inuit that reside in the Arctic. Section 11.12 limits geographic indicators to wines and spirits and focus only economic interests.

Section 16 is problematic. This section relates to persons entitled to the Registration of trademarks. Section 16(1) states:

> That any applicant who has filed an application in accordance with Section 30 for registration of a trademark that is registrable and that he or his predecessor in title has been used in Canada or made known in Canada in association with the wares or services is entitled to Section 38 to secure its registration in respect of those wares or services, unless at the date on which he or his predecessor in title first so used it or made it known it was confusing with:
>
> A trademark in respect of which any other person had used an application for registration in Canada;
> A trademark in respect of which any other person had previously filed an application for registration in Canada;

This section is particularly problematic for the following reasons. In the past companies have attempted to register trademark of the Inukshuk. There are other applications registered pertaining Inuit symbols.

Trade secrets: Trade secrets are normally within the confines of advantages over a competitor. As long as the competitor can keep it a secret, he has the right to use it. For the information to be a trade secret three things have to be established: the information must have the quality of "confidence," the confidential information must have been imparted to who the party is enforcing against in a situation where confidence arises, and the unauthorized use of the information would be to the detriment of the communicator. The potential of trade secrets in relation to the protection of Inuit culture may be applicable in the context of environmental management practices and resource management, which may be of importance to new regulations of management of resources outside of land claim areas.

Enforcing trade secret law is problematic as the onus is on the holder to prove that they took adequate steps to prevent disclosure of the information. This is problematic for Inuit where they are willing to share their knowledge on various products and Inuit women have shared this knowledge to researchers in the past. This issue will become crucial when Inuit begin to develop their economies and will rely on their traditional knowledge to make this happen. Trade secrets are legally binding and may offer some use to Inuit intellectual property in conjunction with contractual arrangements.

Although contractual arrangements may be an alternative, it still raises concerns as to the bargaining power balance between Inuit and large corporations. As contractual arrangements are still a new concept it opens up the potential for it to be misused by the party who clearly understands the contractual arrangement concept. This points to the need for educational awareness and training in the area of the law of contracts in Inuit communities.

These existing intellectual property laws fail to recognize the particular intellectual property of Inuit and encourage individual interests and individual values that are dominant in mainstream society and can be strongly argued that it interferes with Aboriginal rights of Inuit and interferes with the goals and objectives of the Inuit land claim agreements.

This legislation has a negative impact on the aboriginal right of Inuit as provided for and protected under the Nunavut land claims agreement. It interferes with the ability to become economically self-reliant and interferes with that right by not having adequate protection. It does not protect the collective and cultural rights of Inuit and does not encourage the protection of Inuit culture, which would be a required element to enhance their cultural well-being. It does not provide them with the incentive to protect their cultural heritage. The criteria for intellectual property protection does not fit or reflect the values of Inuit society. It places an impossible burden on them in terms of protecting their intellectual property. It overlooks and devalues their traditional knowledge and customary laws for protection other cultural property. It does not reflect the obligations of government as set out under the Nunavut Land claims agreement. It limits their ability to exercise their right as set under the land claims agreement. The legislation does not reflect their community values that are fundamental component to their continued existence as a distinct aboriginal group. A negative effect has already been placed on Inuit through this legislation in the sense that it does not provide for adequate protection for their innovations and practices and does not adhere to values of Inuit society and its impact if they were to apply this legislation to Inuit society.

What makes this framework more profound is the annex which notes that the Government did not address the recommendation of the Royal Commission on Aboriginal Peoples which recommended that the "federal government, in collaboration with Aboriginal peoples review its legislation on the protection of intellectual property to ensure that Aboriginal interests and perspectives, in particular collective interests are adequately protected." The framework annex spells out some of the issues to be considered but does not spell out how these will be dealt with. This policy framework and the existing intellectual property laws in Canada do not provide an avenue toward self-determination for Inuit and continues to interfere with it. (From "Legislative Measures and Canadian Arctic: The Investigation of Status and Trends of Traditional Biodiversity Related Knowledge in the Arctic Regions" by Violet Ford 2005.)

5.1.3 Land and resource use; land and resource management

Sami traditional rights and sustainable use of biodiversity are related to land use. Sami people's participation in decision-making, participation in projects of sustainability and developing their resources is still limited because their legal position is not ensured.

Since 1952, the Finnish State Law Committees have recommended many times, without any success, that rights of the Sami to land, water and traditional livelihoods have to be secured through law (The Finnish Sami Parliament 1997; Sami Parliament Report 2003). The European Human Right Commission has criticized the Finnish government not to investigate and solve the Sami rights issues. The question of Sami ownership to land has not been solved yet. In 1998, the Office of Chancellor of Justice asked Ministry of Justice to make an investigation on Sami land rights. This investigation has not been leading to any results and the rights of Sami to their land are still unsolved (Sami Parliament Report 2003). There is now a study project going on regarding the settlement and population history in relation to rights of Sami and its work will be finished in 2005. The Sami Parliament is conducting its own review regarding Sami rights.

In the Sami area, most of the lands, about 90 per cent, are owned by the state. The Sami in **Finland** are dependent on how the Forest and Park Service (FPS) uses and manages the areas in the north. The Finnish Forest and Park Service is concentrated in the economic profitability of its activities and decisions, which may lead to emphasizing of economic factors at the cost of reindeer herding (Forbes 2004, p. 68). FPS uses state lands for commercial purposes by selling fishing and hunting licenses and by hiring cabins.

According to the Finnish Forest and Park Service Law from 2004, utilization and conservation of natural resources administrated by FPS in Sami Home Land area needs to be reconciled with Sami people's right to practice their culture (Forest and Park Service Law, Laki metsähallituksesta, 2004 § 4).

One problem in the application of traditional biodiversity-related knowledge is that the Ministry of Forestry and Agriculture does not recognize traditional ecological knowledge as valuable source of information (Rouhinen and Havu, e-mail interviews in May 2005). The Ministry of Agriculture and Forestry has responsibility for the Sami reindeer herding. The Ministry regulates herding. For instance, it sets the highest numbers that each herding cooperative can own. In 1987-1988 there were 81,000 reindeer owned by the Sami in Finland (Helander, 2003).

It is also evident, that regional herding administration does not have the necessary knowledge of herding (Jernsletten & Klokov 2002, p. 140). Furthermore, generally speaking, research regarding reindeer herding does not make use of TEK or views of the Sami. Herders have criticized the available research knowledge because it does not take into consideration all important aspects, for instance the cultural context of herding (Raitio 2001; Janne Hukkinen et al. 2002). However, improvements have been made and there is now more interest in Indigenous ecological knowledge when studying the sustainability of herding systems (Forbes 2004, p. 9).

In different parts of North **Russia** and Far East the growing pressure on nature caused by forestry, mining and metallurgy activities, exploitation of oil and gas field has great effects on land, in which traditional livelihoods of Indigenous peoples are based on. For example, the transition zone between forest and tundra, an important winter pasture for reindeers, has undergone very extensive disturbance during the last decades. In 1995, damaged lands made up 2.3 percent of its area (Pokrovskaya 1995). By 1980, large areas of the Gydan and southern Yamal Peninsula were showing signs of overgrazing. Ongoing oil and gas exploitation reduces the area of tundra that is suitable for reindeer pasture (Forbes 1999). In addition, effects from industrial pollution have caused a regression of tree line further south (ACIA 2004). Dimitri Ottovits Horolje, President of Russian Association of Reindeer Herders Yamalo-Nenets region, points out that Indigenous peoples and reindeer herders themselves have to respond and try to influence the reform and changes caused by development.

The traditional branches of economy in the northern areas of **Sakha Republic,** Russia are reindeer herding and breeding, hunting and fishing. Twenty-four regions out of thirty-five are involved in traditional northern work in the Republic. The traditional economies still retain major economic and social importance in the rural areas. These are regions and livelihoods usually connected with the native peoples. Reindeer herding is not only a branch of the traditional economy, but very much a way of life and a strong base of ethnic and cultural originality of the native people of the Russian North. It is one of the leading ecological links of natural-economic system, providing efficient relation of man and the environment. Today, there are 690 nomadic families in the Sakha Republic. Domestic reindeer herding can be seen as basis for preservation of traditional way of life of different Indigenous groups. However, the traditional economies are in a deep crisis and there is a consequently low level of living conditions of the people involved in them. Social problems and alcohol abuse are evident in small rural communities. The unemployment rate is very high, especially among young people.

The authorities and officials also acknowledge the fundamental importance of the traditional economies. V. Shtyrov, the president of Sakha Republic, states the following in his greeting of the participants of the 3rd International congress of Reindeer Breeders: "It is necessary to pay special attention to preserving the traditions of the Native people of the North…The authority of the Republic Sakha (Yakutia) considers the restoring of the reindeer breeding, preserving the traditional culture, and the way of life of the Native people of the North as the task of its first priority. We need to solve several problems to improve their living conditions."

In **Yakutia**, mining industries have damaged the structure and function of both marine and terrestrial ecosystems, decreasing their productivity and impoverishing their biological diversity. Radioactive pollution has numerous and varied sources in the region: underground nuclear explosions, dumping of radioactive waste and testing of nuclear weapons. Hydroelectric power production and logging practices continue to have significant local environmental impacts. One of the most critical unsolved problems in the region is the handling of hazardous wastes (Newell 2004, p.242). (Text on the traditional economies in the Sakha Republic from "Sakha Republic Biodiversity and Local Knowledge" by Kaisu Mustonen & Tero Mustonen 2005.)

Case study: Samarga - Traditional ways for the Udege (Russia)

The Samarga River watershed is located 1,100 km north of Vladivostok, the regional capital for the Primorskii Krai Administrative District in the Russian Federation. The mouth of the Samarga empties into a confluence zone for the Tatarskii Straits and the Sea of Japan and is a marine area where both northern and southern marine life forms mix. 74 percent of the Samarga River watershed is forest (Panichev, et al. 1998. p. 177).

The watershed's main resources have by now been developed. There is an approximately five million cubic metre reserve of timber. There are many different species of non-timber forest products, both medicinal and edible (mushrooms, berries, and fern). Although less intensively than in the past, local people continue to trap (sable, squirrel, weasel, mink and otter) and hunt game (elk, red manchurian deer, wild boar, musk deer) for personal use. Increased demand from Chinese buyers for bear and musk deer by-products has reduced their numbers (see Siberian Tiger/Forests Report). On the coast, fishing vessels harvest invertebrate species (sea cucumber, crab, sea urchins). There is intensive harvest of fish resources (Bocharnikov & Bocharnikova 1997). Habitat for anadromous salmon species is one of the watersheds key ecosystem considerations; the watershed has been habitat for salmon since the tertiary period. The Samarga hosts many resident fish species. The stability of complex ecosystem relationships assures annual, massive spawning of salmon: cherry salmon, pinks, and loach. Brown bear and other large predators top the watershed's food chain (Knudsen, 1999).

There is now a conflict between the interests of the watershed's Indigenous peoples and the interests of the timber industry and local authorities. The Indigenous peoples want to create a federally authorized protected territory, a Territory of Traditional Nature Use (TTP), to preserve their traditional way of life: hunting, fishing and collection of non-timber forest products. Regional authorities are concerned with the socio-economic development of Terneiskii Raion, the local administrative district in which the Samarga River watershed is located. Local Indigenous peoples are justified in their concern that commercial timber harvest will cause harm to not only their historically evolved traditional way of life but will also cause irreparable damage to the watershed's ecology and socio-economic infrastructure. The appearance of forest workers and the construction of roads that currently do no exist in the watershed will fundamentally change the way local people hunt, will dramatically reduce the number of wild animals and the volume of fish and these roads will significantly alter the hydrologic character of the watershed (Kanchuga, 1995).

TerneiLes, in compliance with current Russian Federal law, is prepared to finance a program to examine necessary steps to assure the sustainable use of the watershed's timber resources. Most local and regional environmental NGOs, including the Russian Far East office of the World Wide Fund for Nature (WWF), support a position that if timber harvest is to occur in the Samarga, TerneiLes is the company to do that work. The WWF position is that a regional level Ethno Nature Park can be created in areas where large-scale commercial timber harvest is inappropriate and in areas where there are already exist restrictions on timber harvest to meet the traditional use needs of the Udege. Local people do not agree with this position since an Ethno Nature Park will not

guarantee the protection of the watershed's ecosystem is not underwritten with funding and is lacking a reliable legal basis.

On March 5, 2002, the Primorskii Krai Legislature (Duma) held a special hearing during which the opinions of all interested groups were heard. As requested by the Udege of the Samarga River watershed, a decision was made to support the creation of a Federal level TTP. It was further agreed that there is an urgent need to evaluate existing forest reserves in the watershed and to develop a timber harvest plan. This work will be financed by the timber industry with a promise to include a broad spectrum of scientists and the public. This effort, however, does not stipulate that there will be an effort made to use the traditional understandings and knowledge of local residents, nor is there a mechanism for the full and equal participation of these local residents in any decision making process. The inclusion of local residents in this process can only be assured if an effort is made to establish a database of traditional knowledge and through an effort to establish a mechanism to evaluate the consequences of any specific actions planned for the watershed.
(Case study based on "Samarga: Traditional Ways for the Udege or a Forest Desert of the Future?" by Vladimir Bocharnikov, 2005.)

5.1.4 Globalization, external economy and resource extraction, tourism, economic problems, marginalization of Indigenous areas

Greenland: Richard A. Caulfield counts in an article (2000, pp. 173-180) some threats to Greenlandic survival: economic vulnerability, rapid social and cultural change, global change and industrial contaminants in Arctic food and animal rights challenges to sustainable use of various resources. Economic vulnerability goes hand in hand with modernization and globalization. For example, there are pressures on Indigenous language, population movement away from small settlements, and new demands from wage employment and international mass consumption patterns.

Sami in Kola Peninsula: In 1990, there started a rapid development of tourist sport fishing of salmon on the Kola Peninsula. The Murmansk Fishing and Water Department alters rules and periods for salmon fishing nearly every year for the benefit of foreign tourist fishing. In 1995, the inhabitants of the Kanevka village could fish salmon on the Ponoy River at a length of 60 km without any time limit. In 2000, they were allowed to fish on the same river but only at a length of 10 km and only on its left side, for a period of maximally 6 hours with a maximum catch of one salmon and one other type of fish (Andrei Zakharov, Sámi reindeer herder, Kola Peninsula 2003, pp. 27-28). The **Sea Sami** case of Vestertana in Norway exemplifies the dynamism of global processes: the flow of products and money, the special arrangements of power, control over the flow of money, the modernization efforts of the local communities by the states/centre, the reactions of the local to the global, and conflicting resource management and economic alternatives. For the Norwegian state, the fish resources are nationally Norwegian. Fishing is an international industry and fish-products have an enormous export value. Fjord Sami practice small-scale fishing and lack power to manage the resources in their areas. Their knowledge and customary rules are not valued by the Norwegian fisheries administration.

The Arctic Sustainability Project of **Russian** Academy of Sciences (ASP) interviewed Indigenous Peoples in Russian North, Siberia and the Far East (IPRN) in order to identify key problems concerning environmental change and human effects on the environment from the Indigenous point of view. Problems that are most essential for the IPRN traditional activities and well-being were ranked by the Indigenous peoples in following order: poaching, forest fires, industrial logging, clearing of forests for firewood, water pollution by industrial wastes and discharges. Nomadic people living in the **Russian** Far East, Siberia, and the North face many difficulties, including economical problems and harsh weather conditions, and therefore they need special support from the government to survive. Traditional economic activities pursued by the northern Indigenous ethnic communities during Soviet times were appropriately supported by the central government. However, over the past three years remote settlements in the Evenk,

Koryak, Nenetsky and Chukotsky autonomous districts, Amur, Irkutsk, Kamtsatka, Magadan, Sverdlovsk, Tomsk and Chita regions, and the Primorsky territory have not been adequately provisioned for the long winter months as promised. The small Indigenous ethnic communities located in the Russian Far East and Siberia have encountered similar hardships. The government program for economic and cultural development of small ethnic communities in the Russian northern territories, which aimed to put in place industrial and social infrastructure, has year after year failed to meet its goals. The unemployment rate for the active Indigenous population in the Amur region has reached 51 percent, as compared to 12 percent for the region as a whole and 8 percent for all of Russia. Since 1990, fertility rates among the local ethnic communities have dropped by one third, and death rates have almost doubled; the average life expectancy of the northern Indigenous people being 10–12 years lower than for Russia as a whole. (Russian text based "The Use and Maintenance of Traditional Knowledge, Innovations and Practices of Local and Indigenous Peoples in the Russian Arctic" by Tatiana Vlassova 2005, and "An Assessment of the Implementation of the Russian Government's International Commitments on Traditional Forest-Related Knowledge from the Perspective of Indigenous Peoples" by Vladimir Bocharnikov 2005a.)

Administrative district of Nizhnikolymsky, Russia: Nizhnikolymsky Ulus is located in the Arctic zone and is the most northeastern district of the Sakha republic. The total area is 87,100 sq. km and the population only about 5,600. Indigenous peoples who inhabit the area are Dolgans, Evenk, Even, Yukagir, Chuchki and Nenets. Main economies are traditional: reindeer herding, hunting and fishing.

The region is mainly tundra woodlands, and the Kolyma River runs through the district. There is great abundance of wildlife. Due to the special nature and rich but fragile tundra ecosystem this region has been prioritized as an ECORA pilot area. ECORA is a multi year, multi governmental process of habitat protection in the Russian Arctic. The practical implications and acts are being designed during the year 2005 and will be implemented in the near-by future in the Kolyma area.

Chersky: The population of the town is approximately 3,800, of which about 300 belong to different Indigenous groups. The community is in crisis. The number of people living in Chersky is constantly dropping, during the Soviet time there used to live 80,000 people. Now the condition of housing is bad, there is a big problem with unemployment, especially among young people, and serious problems with alcohol abuse and domestic violence. There is also shortage of doctors and teachers in the area. (Text on Nizhnikolymsky and Chersky Russia from "Sakha Republic Biodiversity and Local Knowledge" by Kaisu Mustonen & Tero Mustonen 2005.)

5.1.5 Climate change, global change, environmental threats

Climate of the Earth is changing. Raise of the global temperature happens at a rate that is unprecedented in the experience of modern human society. While some of the historical changes in climate were results from natural causes and variations, the strength of the trends and the patterns of change emerged in recent decades indicate that human influences, resulting from increased emissions of carbon dioxide and other greenhouse gases, have now become the dominant factor. Climate change is projected to result in major impacts in the Arctic. Some of these changes are already underway (ACIA 2004). The climate changes are not uniform, but for the Arctic, there is a clear trend for the increase of both summer and winter temperatures and temperatures over land and over oceans as well. Many species will become extinct. **Inuit** culture is already very threatened by the climate and global change. It is important to monitor the overall impacts of the climate change in order to study causes of change and to understand the impacts and what can be done. Action plans, such as "The Arctic Council Action Plan to Eliminate Pollution" are of great value in relation to environmental threats. International conventions constitute a very important ways of decreasing the levels of contaminations in the Arctic (AMAP, Arctic Pollution 2002, pp. 77-97).

Greenland's problems related to biodiversity preservation are partly connected to exploitation of species by hunting and fishing (The Biodiversity in Greenland (2003, p. 136). The recent voice of the Inuit claims

that the real threats come from climate change and from airborne and seaborne pollutants (Inuit Observations on Climate Change 2001; Helander & Mustonen 2004; Gertz 2005).

The sources of contaminants in food are almost entirely found in the industrialized countries of Europe, Asia and North America. In the Arctic, the problems are already severe. For instance, the **Inuit women of Western Greenland** have high levels of PCBs and other persistent organic pollutants in their bodies (Caulfield 2000, pp. 177-178). Animals and plants are very much affected by climate change and contamination. Contamination is seen for instance in marine food chain regarding polar bear-seal-human. The Porcupine caribou is an important component of the mixed economy of many **North American** groups, such as the **Vuntut Gwich'in** people who hunt the caribou. Caribou has historically "served as a critical resource, allowing northern Indigenous people to survive the hardships of severe arctic and sub-arctic conditions (ACIA, Impacts of a Warming Arctic 2004, p. 71). Caribou seems to be very sensitive to the climate change effects.

Environmental threats to the **Sami** of the **Kola Peninsula** are connected to the loss and destruction of reindeer pastures due to industrial expansion and pollution; pollution by mining industry; hydroelectric projects; radioactive pollution; reindeer theft and poaching by military servants and others; commercial foreign tourist enterprises; and climate change (Helander & Mustonen 2004; Rasmussen 1995; Afanasjeva & Rantala 1993; Rantala 1995; Zakharov 2003). One problem regarding the environment of the north is **military presence**. There are several examples on nuclear disasters in the northern seas and territories. For instance, in April 1989 a Russian attack submarine with two reactors and two nuclear warheads in each of its ten torpedoes sank into the depths of the Norwegian Sea (see, Heininen 1990, p. 94). "The military presence as such - large naval bases, naval ports, eavesdropping stations, cables, airports with their equipment and operations - is an acute problem because it erodes nature in times of peace, too" (ibid., p. 93; see also Byrne & Fouillard 2000). Military presence in itself causes stress to local Indigenous populations such as the Sami of Kola Peninsula. Low-level flights in **Labrador** have caused much harm for the local **Innu** people.

Climate change causes thinning of sea ice and Indigenous populations who depend on fishing and hunting marine mammals will face serious problems as hunting becomes more difficult and dangerous. Populations of marine mammals and seabirds are reduced and displaced. Decline in summer sea-ice is continuing and likely to push the populations of polar bear and ringed seal towards extinction. These extinctions will have major impacts on people who depend on these species. In the **Bering Sea**, unusual algal blooms, abnormally high water temperatures and low harvest of salmon on at the time they return to spawning areas have been observed. Changes in ice-conditions have been observed among Indigenous peoples throughout the Arctic. Indigenous peoples are now noticing changes in weather and ice conditions that are unique in the long experience of these peoples (ACIA 2004).

Climate change is also linked to the transport of contaminants from outside to the Arctic and within the Arctic regions. For instance, airborne pollutants are moving from Eurasia and North America to the Arctic areas (see AMAP, Arctic Pollution 2002).

In Northern **Russia**, Siberia and Far East, large areas of reindeer pasturelands are already lost to petroleum extraction and other industrial activities. Effects of climate change are likely to add more stress on these areas. It is possible that warming will degrade permafrost, which underlies most of these regions. Degradation of permafrost is likely to disrupt traditional reindeer migration routes. Warming is also projected to cause earlier melting and later freezing of sea ice in the Ob River delta, which can cut the access between winter and summer reindeer pastures. Autumn weather in some areas has been changing between raining and freezing, often creating ice layer on the ground. This ice layer reduces reindeer access to underlying lichen. Also changes in the rate of spring melt and increased variability in spring weather conditions has an impact on access to hunting and fishing camps. From the perception of Indigenous peoples, the Arctic is becoming an environment at risk. Unusual weather patterns occur,

vegetation cover is changing, animals are no longer found during specific seasons in hunting areas and the sea ice is less stable (ACIA 2004).

Alexei Gavrilovich Tretjakov, an Evenk reindeer herder from **Sakha**, notes that the weather is getting warmer; the ground is 'sinking', maybe because it is more wet than before. There are more floods in the region and lakes have disappeared because the ground is sinking. This greatly affects the local landscape. Tretjakov has seen the arrival of sable into the region. Sable is traditionally a species of taiga habitat, which is now spreading northwards to the tundra regions. It has also replaced squirrel in the border areas between taiga and tundra in the area. (Text on Alexei Gavrilovich Tretjakov from "Sakha Republic Biodiversity and Local Knowledge" by Kaisu Mustonen & Tero Mustonen 2005.)

5.1.6 Modernization, unequal power, conflicts, colonialism, cultural and linguistic oppression

Modernization involves overall changes relating to local communities and affects social life, food habits and life-style, settlement patterns, subsistence activities, technology, schooling, gender issues, political life, etc., of Indigenous people. Loss of lands, loss of rights, loss of community values, loss of contact with nature, loss of traditions, loss of meaning of guaranteed rights, loss of language and traditional spirituality are some of major threats that Indigenous peoples of the Arctic are facing. Regardless of many improvements that are taking place in the life of the Indigenous peoples there are many threats coming from the modern society including several factors, among them continued colonialism, language suppression, and land use conflicts. In **Greenland** there are "cultural and ideological conflicts" between **Inuit** and Danish people (Jónsson 1996). Colonialistic attitudes are still to be found among the Finns of **Finland** and among the Sami themselves (Kuokkanen & Riihijärvi 2005). "Colonialistic relations are the outcome of the conquest and exploitation of less powerful people by dominant nations" (Kaarina Kailo, Definitions, Private paper 2005). Many Indigenous women feel that they are subjected to unequal power in their own society, but especially in relation to mainstream society. The Indigenous peoples of **North America** are fighting for the survival of their traditional customary rights, land ownership and cultural values such as sharing and respect for nature.

Greenland is one of the Arctic regions that have gone through a rapid modernization. One problematic issue is that people in Greenland are relocated to Nuuk and other "towns." **Inuit** have their roots in small settlements and the hunting and fishing culture, and many of them may have certain difficulties to adapt to new ways of production and hierarchical administrative, linguistic and educational demands, and qualifications (Jónsson 1996, p. 136-141). Their traditional kinship- and family-based social organization has been largely fragmented (Jónsson 1996), and there is a social differentiation going on (see articles in Petersen & Poppel 1999).

Generally speaking, the formal rights of the **Finnish Sami** "prove not to have been translated into practical political action to any particular extent" (Josefsen 2005, p. 183). The attitudes towards Sami people of Finland may be "neutral or fairly accommodative" (Eriksson 1997, p. 117). The local authorities are "reserved and even negative towards Sámi special needs" (Aikio 1994, p. 42). Since 1995, there has existed a campaign in Finnish media transmitting anti-Sami views and attitudes. There are "repressive elements in the Finnish Sami policy" (Eriksson 1997, p. 119). Sami Parliament lacks financial resources to implement the Sami laws and political goals. The above-mentioned factors may result in the overall passivity of the Sami people (Eriksson 1997, p. 119), and that the land rights issue will be delayed or unsolved (cr. The Finnish Sami Parliament 1997).

According to the *Sami Parliament Act* 974/1995, § 9 in Finland, the authorities shall negotiate with the Sami Parliament on all wide-ranging measures (land use, conservation areas and wilderness areas, community planning and mining activities), which may have an influence on the status of Sami as Indigenous people. The Finnish administration has however not negotiated with Sami in all matters affecting them, in accordance with this law. Therefore, the law has remained "a resolution with little real

content" (Josefsen 2005, p. 183). It is noted that Finland still treats the Sami people as a national linguistic minority rather than an Indigenous people giving the false impression that legal protection of linguistic rights alone is sufficient for the Sami people to be able to maintain its culture (IWGIA 2005; see also Sami Parliament Report 2003).

5.1.7 Unemployment, social problems, alcoholism, diseases, healing

Unemployment rates are high on **the Kola Peninsula.** For example in the coastal villages of the Murmansk region there is up to 40 percent unemployment (AHDR 2004, p. 141). In Lovozero, the unemployment rate is as high as 60 percent (Rantala 1995, p. 58). Generally described, unemployment is higher among women than men (Riabova 1999). The status of the Sami is low in social hierarchy (Afanasjeva & Rantala 1993; Rantala 1995). The life expectancy for the Sami men is 44 percent. The Kola Sami have low living standard, problems with housing and electricity, and problems with alcoholism (Afanasjeva & Rantala 1993).

During 1990's in **Russia,** there was a fast decline of fertility rates, which was aggravated by the severe economic crisis. Russia has low infant mortality rates but high adult mortality rates. In the Arctic as a whole, Russia has the lowest life expectancy. Decline in life expectancy has been remarkably faster among men than among women. Russia is facing a gender gap in life expectancy of about 13 years, which is larger than anywhere else in the Arctic. The share of non-natural death is very high in the Russian Arctic. Reduced possibilities to continue the traditional livelihoods can increase the risk of mental health crisis and suicides. In the Arctic as a whole, indications of ways to address the problem of high suicide rates have shown that in some areas where there have been efforts to allow local self-government, mental health has improved. Suicide risk also has a strong linear relationship with the number of factors of cultural continuity present in the community (AHDR 2004).

The greatest ever outflow of population from the Russian Arctic has happened in past 15 years and is still going on. The greatest losses have been in **Chukotka**, where about 70 percent of the population registered in 1989 are lost due to migration. The Arctic part of the Republic of Sakha has lost almost one-half of its population, while the Sakha as a whole lost only one fifth of its overall population. The Yamalo-Nenets Okrug has minimal losses of a mere seven percent of the 1989 population (AHDR 2004).

Native spirituality and knowledge in traditional healing are threatened in many Arctic areas. Traditional medicine and shamanism have been for a very long time discouraged by the mainstream society. In the book "It's Like the Legend: Innu Women's Voices" (2000) by Nympha Byrne and Camille Fouillard, some **Innu women from Labrador** witness how old traditional knowledge fades away with Elders due to a variety of factors, for instance the impact from Western religion and education. Mary Georgette Mistenapeo is worried about what happens to the traditional knowledge when Elders pass away (p. 113). Other women are worried about other things, such as "most young people never learned how to paddle canoes or how to walk in the deep forest" (Caroline Andrew, p. 133). Elements of biodiversity protection and usage is learned in these and similar situations. However, many young people grow up without spirituality and contact with traditions. The book "Cosmology and Shamanism" by Bernard Saladin d´Anglure explores shamanism among the **Inuit** Elders and how young students approach Indigenous spirituality in the classroom context. The lesson is that young people are become interested in traditions, but they need to be taught about their history, traditional values, and medicine of their environment. Also the project "Voices from the Bay" show that the young Inuit and **Cree** when exposed to traditions at local meetings became aware of the traditional ecological knowledge possessed by their Elders. It is evident based on different studies made in the Arctic that "spiritual values contribute to well-being" (AHDR 2004, p. 159).

It is said that health "is a process towards well-being that communities as a whole will achieve and define according to their own values and circumstances, in their particular and unique context" (Saskatchewan

Indian Federated College Journal 1988, pp. 59-60). In **North America**, as well as in other regions, local control of health care has been shown to increase client satisfaction. Integration of local resources, local control, local languages and community awareness among others may be in some cases help to increase feeling of well-being (AHDR 2004).

In the Arctic, the rapid overall changes are having an enormous impact on human health. Lifestyles become Western and the rates of obesity, cardiovascular diseases, and diabetes has increased. In addition, smoking and consumption of alcohol has become common. Inuit communities in the **Canadian** Arctic have identified that alcohol abuse is a priority problem and that binge drinking is a major factor in the occurrences of violence, accidents, employment and family problems, and sexual abuse (Korhonen, 2004). The Ajunnginiq Centre released the report "Alcohol Problems and Approaches: Theories, Evidence and Northern Practices" by Marja Korhonen which provides essential information about the causes of alcohol problems and treatment practices in Inuit communities. The report found that there are "serious inadequacies in knowledge, services, and counsellor skills. However, there is also an understanding of the need for change, and efforts are being undertaken to improve service" (Korhonen, 2004). Cocaine, marihuana, and other drugs represent large problems in many **Alaskan** and Canadian Arctic communities. As already indicated, one severe health problem throughout the Arctic is high rates of suicide. In Alaska**,** there is research that shows the connection between suicides and acculturation. Greater acculturation increases the risk of committing suicide (AHDR 2004, p. 158).

5.1.8 Children, youth, and Elders

Peter Irniq from **Nunavut** puts much faith in Indigenous young people: "Nunavut, I have a lot of excitement for Nunavut. I have a lot of hope for the young people in Nunavut. At the same time I always try to make sure that Elders´ knowledge, Elders wisdom, is passed on from the Elders themselves to the youth of Nunavut" (2004, p. 193). This report and other reports show that Indigenous young people have many obstacles to meet: from the point of view of sustainable development and biodiversity enhancement, it is of importance that they are prepared possibilities to learn traditional ways regardless if they leave or stay in their communities. In schools, the curricula and textbooks can still spread non-native values and knowledge. For instance in **Greenland** the curricula of geography and biology is still dominated by the Danish views and world-picture (Baerenholdt 1999, p. 198). In **Sápmi** likewise, children from traditional families learn little of traditions and biodiversity-related practices in schools. Asta Balto and some other researchers have been making efforts to improve the situation by defining the Sami educational ways to take into account in kindergartens and schools.

A major barrier to Indigenous youth is that they are acquiring different values and lifestyles because of exposure to global and national influences, such as schools mentioned above. Other barriers youth face is the exposure to Western society through television, media, and leaving their traditional communities for larger urban centers has resulted in traditional communication networks breaking down. This means that Elders are often dying without passing their knowledge on to the youth since there are no youth who are able to undergo the training necessary to learn from the Elders.

Indigenous people are, or at least have been, caretakers of the earth. Kim Anderson claims that Indigenous women have a special responsibility "to the earth by working with children and teaching them respect for the environment" (2000, p. 224). She also emphasizes the reconstruction of "sense of purpose" into people's lives and communities (ibid., pp. 201-204). In the midst of rapid changes, a sense of purpose, as related to the nature and its diversity seems important. The Elders have a significant role as mediators of ecological wisdom and know-how. Regarding environmental issues, the "Elders are aware that small changes are taking place and consider these indicators of potential long-term and major problems in the future" (CAFF, Conservation of Arctic Flora and fauna 2001, p. 69). In modern societies however, many older people are placed in nursing homes and thus their roles as Elders are taken away from them.

5.1.9 Environmental organizations

In some Arctic areas, such as in **Greenland,** environmental organizations can be regarded, in some cases, as a threat to Indigenous cultural ways. Environmental groups have concern for the protection of the nature. Nevertheless, "they fight non-damaging hunting forms that were sensitive to environmental protection in former times and still are today. These groups must be seen as comparable to former colonial influences" (Petersen 1992, p. 9). There is lots of discussion going on in Greenland concerning the Home Rule and its relation to environmental protection and sustainability (see for instance, Kjeld Hansen "A Farewell to Greenland's Wildlife" 2002 and Thor Hjarsen "Greenland's International Obligations," 2003).

In **Canada** there had been a "seal war" waging for two decades ever spring (Busch & Henke 1985, as cited by Lee 1989) between the sealers and fur industry on one side and the environmentalists on the other (Lee 1989). This hunt occurred in the spring when large numbers of Atlantic harp seal gave birth to their pups. Greenpeace had been putting pressure on the European market to ban the use of baby sealskins in Europe:

> "In 1983, the new European Parliament outlawed baby seal pelts in Europe. This miserably affected the life of the 100,000 Inuit living in the Canadian Arctic. The seal furnished most of the Inuit diet and nearly all essentials of life, like the buffalo of North American Plains Indians. In the years following the seal-pelt ban, an economic winter swept across the Canadian Arctic and welfare soared. In Canada's tiny Clyde River, nearly half of the population was soon collecting unemployment checks. As their lives soured, their social problems escalated. Many Inuit turned to alcohol and drugs. Crime and family violence doubled. The despair led to an epidemic of suicides, mostly that of young men. There were 47 suicides among Canadian Inuit in the eleven years before the ban but 152 in the same period after it (Xiaogan as cited by Miller 2001).

Environmental organizations can conduct campaigns that have a devastating effect on Indigenous communities. This "seal war" affected Inuit communities that relied on the seal for food and who sold the skins for a much needed cash income.

6. Findings and recommendations

The Arctic areas are diverse in relation to each other with differences and variations regarding people, their cultures, societies, and lands. There are variations in climate phenomena, landscapes, flora and fauna. Many threats and challenges exist in these regions. Obviously, there are also many opportunities and programs leading to beneficial development. The Indigenous peoples of the Arctic share many similarities. They are Indigenous to their lands and have been subjected to overall colonial activities by the surrounding states, and national and multinational companies. The Indigenous peoples have knowledge that is now regarded as useful regarding the management of lands, waters, and natural resources of this planet. Their traditional knowledge is now receiving attention from scientists, politicians, and administrators of sustainability and biodiversity.

The Indigenous peoples of the Arctic Region are dependent on their traditional environmental knowledge to properly manage the resource base of their regions. Their cultural-spiritual set of values is an intrinsic part of their knowledge and guides them in their day-to-day activities and usage of nature. Indigenous lands constitute an ecological-spiritual context of Indigenous knowledge regarding the biodiversity of these areas. The loss of Indigenous lands and practices means a loss of biodiversity knowledge.

Article 8(j) of the Convention on Biological Diversity is oftentimes constrained to deal with a limited set of issues, which seem to be easy to administrate and implement. However, according to the findings of

this report, there is a need to analyze article 8(j) in a broader way and take into account other sections of the CBD as well. There is also a need to go through the other international conventions and documents (for instance, Agenda 21, ILO No 169) as well as the national legislation and regulations that have to do with Indigenous people and that affect their lives. National capacity for implementation activities must be promoted. National authorities need to include different stakeholder interests in their policymaking processes.

Parties have to restructure their land rights policies. In many cases, Indigenous societies and groups do not have sufficient national legislative support and or any degree of self-governance that is needed for maintenance of their biodiversity-related practices and knowledge for successful implementation of article 8(j). Furthermore, the options to participate in the decision-making processes at the national, regional, and local levels are in many cases weak or non-existent. Full participation and responsibility in the decision-making process regarding the management of resources must be promoted. Self-determination of Indigenous peoples is a key issue.

Article 8(j) and traditional knowledge are cross-cutting issues that are related to many sectors of society including politics, research, administrative measures, economy, legislation, education, and information. Economic arrangements should be developed to enable Indigenous participation in the decision-making processes that affect their lives. Stating that Indigenous people are welcome to participate without providing funding is not adequate since most Indigenous communities' lack the financial means to fund their own participation. This results in the inability of Indigenous communities being able to promote the use, and implementation of 8(j)-related traditional knowledge. These economic mechanisms must also enable Indigenous peoples to develop their own sources of revenue ensuring their communities can become more self-sufficient. A financial program needs to be established to cover the national costs emerging from 8(j) implementation.

A challenge to take into consideration is that the biodiversity infrastructure (legislative measures, monitoring programs, financial support systems, capacity-building plans or other suitable indicators) required for the assessment of biodiversity and knowledge, as it is related to Indigenous communities, is in many countries poorly developed or implemented. The different sectors of modern society, at all hierarchical levels, need guidelines for the implementation of article 8(j). In addition, the knowledge and information-sharing regarding biodiversity is scattered and therefore difficult to access. Researchers, policymakers and others should identify the key issues regarding biodiversity and climate change factors and bring them into public awareness to be shared and debated. Public awareness may lead to more environment-friendly attitudes and life-styles that promote the protection and promotion of biological diversity.

In some Indigenous communities, the local Indigenous governments or power-holders do not see any value in maintaining or passing on traditional knowledge. This creates a difficult situation for the holders of traditional knowledge and for those who want to maintain and develop traditional knowledge base. The Indigenous youth and other members of local communities may show little interest in the traditional life-style, values and knowledge. When exposed to traditions the young people become aware of the importance of traditional ecological knowledge and related practices. Educational activities and information sharing must be strengthened to address these problems. Capacity-building measures have to be taken. The Indigenous institutions, research organizations, political structures, and communities need support to conduct their own activities in relation to article 8(j). It is important to have an approach that reaffirms and supports local knowledge, strengths, and values, when possible and appropriate, instead of using outside expertise.

Local Indigenous societies, including their individual members, need support for their overall viability and well-being to become a reality. The sustainability of these communities can only be achieved if they have the ability to fully interact and relate to the environment, ensuring that its biodiversity and health is

maintained.

Equality and equity of men and women is of relevance to the achievement of sustainability and to the pursuit of biological diversity measures. Empowerment of women is crucial as they sustain community life and its knowledge base. Environmental pollution affects women and children they bear and women oftentimes react to negative local changes by changing their place of living. In a possible scenario, the women of the Arctic are left outside the planning, decision-making, and implementation of article 8(j). It is relevant to identify the gender issues and promote appropriate action in relation to the women's values, knowledge, and practices. The CBD article 8(j) especially concerns future generations. Parents and Elders may aid local communities and schools to foster biodiversity-related education.

One of the big challenges regarding traditional knowledge is its commercial value. Indigenous knowledge is sold or misappropriated, and only a small part of the income from the knowledge and practices come back to the source communities. In addition, the trading can cause internal division within the Indigenous communities. In many cases, the states allow international companies and state agencies to appropriate Indigenous knowledge and property. The states develop laws and standards for assets that they do not own or have previously used. Regarding the Access and Benefit Sharing (ABS) of Genetic Resources agreements, Indigenous groups feel that before they can negotiate the access and benefit sharing of these resources and their traditional knowledge there first must be in place mechanisms and policies that will protect their traditional knowledge. In some cases there is lack of trust in governments and scientists, which may have an impact on the willingness to negotiate. It is also imperative that there is a discussion regarding cultural and intellectual property rights surrounding the mechanisms of protection and the right to dispose natural resources including intellectual property. Many states and authorities regard cultural items and knowledge as property owned by state, society at large, etc. A special national law may protect Indigenous property. There is a need to address the issue of benefit sharing from the use of traditional knowledge as defined in article 8(j).

Researchers and scientists have to evaluate their research activities, values, concepts, and theories regarding how they conduct their research in Indigenous communities, or how the research can impact these communities. Researchers are now being encouraged or required to provide information back to the communities that they can use for their own purposes. Participatory research activities are preferred and valued. There is a need to further develop guidelines regarding traditional knowledge research, education and political-administrative-legal implementation processes. The overall documentation of traditional knowledge concerning species, ecosystems, Indigenous management activities, and other factors relating to the article 8(j) is urgently needed. Research needs to identify knowledge gaps and bring into light its products by participating in public policy discussions.

Documentation is not enough to maintain the traditional knowledge that benefits biodiversity and the sustainability of the Arctic. One needs to support local subsistence activities and look for economic alternatives at the local levels. Most biodiversity-related knowledge of Indigenous peoples is related to and sustained by everyday practices and these need to be maintained and encouraged.

Climate change issues need to be addressed because many Indigenous cultures are already now at risk of extinction. It is important to cooperate internationally because many problems facing the Arctic areas originate from the countries in the south. Climate change enhances the movement of pollution and contamination to the Arctic regions. International and local observations of climate change, species, and ecosystems are of importance and have to be supported. The traditional knowledge of Indigenous peoples can assist in the observations of climate change. States should also take all necessary measures to reduce pollution, resource depletion, military activities, and prevent negative climate change impacts from negatively affecting Indigenous communities in the Arctic.

This report has found that there is a broad range of activates and initiatives that are currently happening

across the Arctic countries that are facilitating the promotion, practices, and preservation of traditional knowledge. These activates are meeting with various levels of success, but the one clear thing is that there is a desire to protect traditional knowledge for future generations. Unfortunately, this will be not enough since this report has also found that there are many threats to the maintenance, preservation, and application of traditional knowledge across the Arctic regions, and these ongoing threats have to be addressed, otherwise the decline of traditional knowledge and biodiversity will continue unabated.

The goal and commitment of the CBD Parties is to reduce biodiversity loss by 2010. There are several levels or hierarchies of implementation: international/global, national and regional/local. In summary, the recommendations are given below:

International and Global:

- Other applicable sections of the CBD need to be analyzed and addressed in a broader way.
- Other international conventions and agreements have to be analyzed and addressed in relation to implementation of CBD to see what gaps and overlaps exist to minimize future problems.
- Cooperate internationally to monitor and address climate change, contamination, and pollution, which is an international problem. Appropriate measures have to be taken to prevent damage to Indigenous societies.
- International research programs need to communicate and address issues surround traditional knowledge and biodiversity.
- Increased communication and collaboration between institutions and organizations that are addressing the issues of Indigenous knowledge and biodiversity in the Arctic, and to make efficient use of resources, identify critical issues facing the Arctic, and to examine where there are gaps and overlaps in organizational activities.

National:

- The CBD Parties need to revise their policies and legislation that affect Indigenous peoples and ensure there is secure funding to implement legislation regarding biodiversity and traditional knowledge.
- Indigenous self-determination should be recognized, national legislative support provided, and land and resource rights need to be addressed and solved.
- Information regarding biodiversity needs to be delivered to different stakeholders, and the public. Capacity-building processes need to be strengthened nationally at all levels. Empowerment and education of Indigenous peoples should be promoted.
- Indigenous participation in planning and decision-making processes should become fully participatory.
- Research is needed to document traditional knowledge of Indigenous peoples and to incorporate this knowledge in various research activities and action programs concerning sustainability, management, biodiversity and climate change.

Regional and Local:

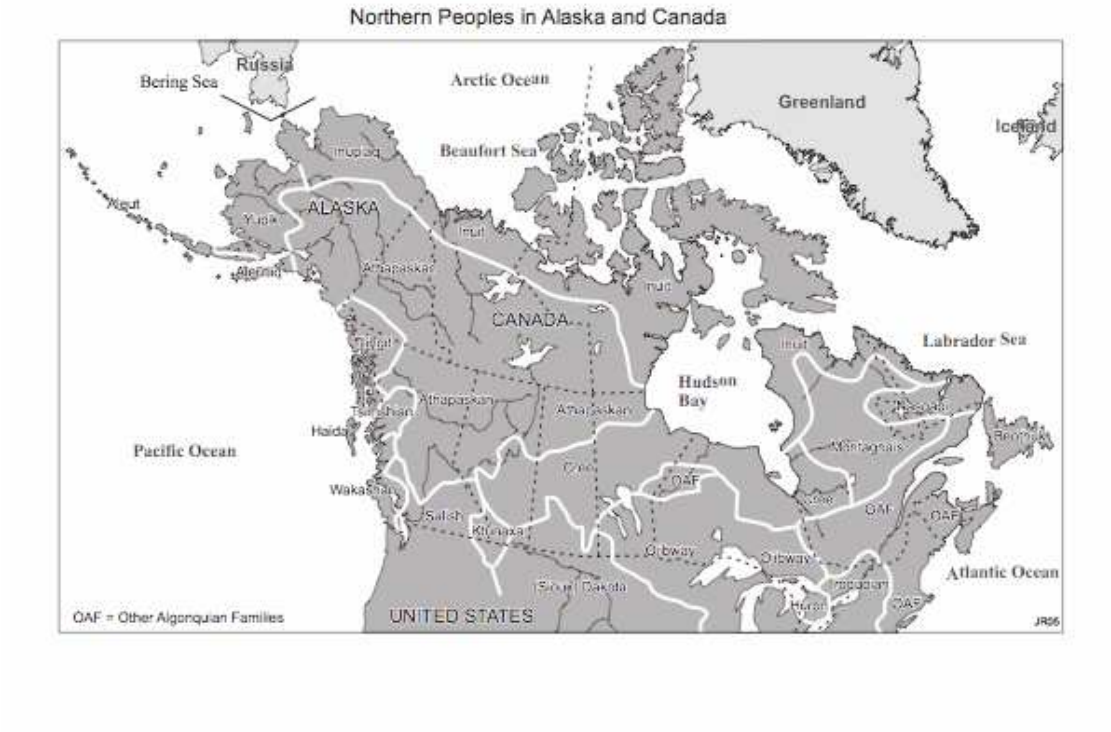
- Local Indigenous subsistence and management activities need support from the government, local communities, and all stakeholders to ensure that peoples' knowledge is used and respected in the protection of their environment.
- Local alternative economies, such as tourism, should be developed in a responsible manner to meet the modern challenges local people face. In this context, different capacity-building measures and educational programs are needed in order to learn to respond to changes.
- Use and build upon the existing local resources and capacity available rather than developing new initiatives and promptly implement projects that address local community needs.
- Promote education initiatives such as biodiversity, and cross cultural education in the local communites, schools, colleges, and universities.

- Ensure that Indigenous peoples receive proper compensation from the benefits connected to the extraction of natural resources in their areas.
- Stakeholders and policy developers need to extend their lines of communication and discuss the relevant issues that communities are facing, and engage the general public. Incentives for commitment and involvement in the protection obiodiversity need to be developed.
- Researchers need to follow guidelines regarding the collection and use of traditional knowledge and provide useful and applicable information back to the communities.
- Develop processes to ensure proper respect for all people, to bridge the gap between youth and Elders, and to disseminate the combined knowledge, experiences, perspectives, and spirituality into the communities.

- **Maps and Indigenous populations**

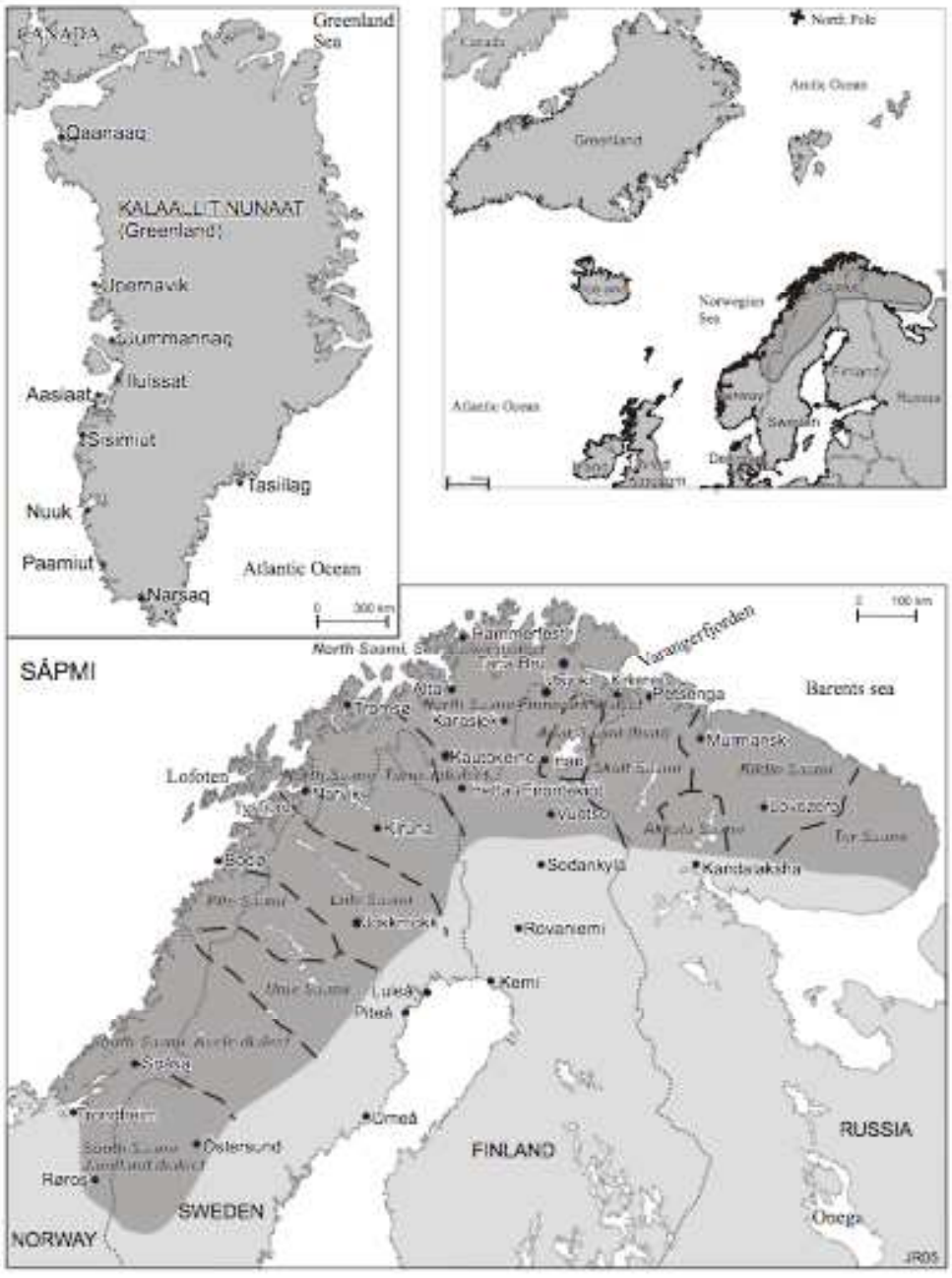
Indigenous Peoples in the North American Arctic and Sub-Arctic

The Indigenous people in Alaska are the Iñupiaq and Yup'ik Inuit, Alutiiq (Aleuts), Athabascans, and Tlingit with a population of 119,241 (Indigenous people identified as American Indian and Alaska Native, US Census 2000). The Indigenous people in Canada are the Inuit, Athabaskans, (such as the Yukon First Nations, Gwich'in, and Dene) and Métis. In Canada, there are 66,000 Indigenous people in the Arctic (Census 2001). There are 6,540 in the Yukon, 18,725 in the Northwest Territories, 22,720 in Nunavut, and approximately 16,000 in Québec-Labrador.



Indigenous peoples in Europe

There are approximately 60,000-100,000 Sami living in Norway, Sweden Finland and Russia. In Norway there are about 40,000 Sami, in Sweden about 20,000, in Finland about 7,000 Sami, and in Russia 2,000. Sami call their land Sápmi. The amount of people living in Greenland is 56,375. 88 % of the population is Greenlandic (Inuits and Greenland-born whites). 12 % are Danish and others. Greenland is now known as "Kalaalit Nunaat."



Indigenous peoples of the North Russia, Siberia and Far East

Numbers of people are according to 1998 census.

Sami inhabit Kola Peninsula and there are 1,105 Sami peoples in Russia. Most of the Khanty live in Khanty- Mansi and Yamalo- Nenets Autonomous Okrygs and are numbered 17,289. Mansi live in Kahanty- Mansi AO and Sverdlosk region and there are 4,873 of them. The Nenets, who number 33,045, live in Khanty-Mansi and Yamalo-Nenets Autonomous Okrygs. Nenets live also in Krasnoyarsk region and Taimyrsky AO, which are home to Enets as well. There are only 116 Enets left. Selkups are decendants of aboriginal population of the central Ob region and they number 2,980. Evenks live in Sakha republic, Chukotka AO, Magadan, Khararovsky and Kamtšatka regions and there are 25,548. There are only 829 Nganasans, living in Taimyr. Nanai number 8,280 and live in mostly Khabarovsk and Primorsk regions. There are 2,439 Ulchi, living mostly in Khabarovsk region and 1,116 Udege who live in Khabarovsk and Primorsky region. There are only 384 Negidal, who live in Khabarovsk region. Dolgans, who number 5754, live in Taimyrsky AO. There are 12,995 Chukchi people who inhabit Chukotka AO, Sakha republic and Koryak Autonomous District. Koryaks number 6,524, living in Koryak region and Evens 12,017, most of them living in Chukotka. Itel'men number 1,449 and they inhabit Kamtšatka region.Tuvinian-Todzhin number 5,144, Shor 3,485, Teleut 2,161. Shor and Teleut inhabit Kemero region and Tuvinian-Todzhin Tyva Republic. 662 Kumadins live in Altai Kray. Ket number 939 and Aleut 278. Ket inhabit Krashnoyarks region and Aleut live in Kamtšatka. Nivkh number 2,711, and inhabit Kahbarovsk region and Sakhalin. There are 601 Orochs, who inhabit Sakhalin, Khabarovsk and Magadan. Only 5 Oroks are left, living in Sakhalin. Chuvantsy number 487, living in Chukotka. Eskimo number 1,514, living in Chukotka. Yukagir, who inhabit Sakha republic and Chukotka autonomus okryg, number 672. (RAIPON, http://www.raipon.org, and Funk & Sillanpää 1999.)

Circumpolar map

Authors and experts

Consultant of the project, report editor-in-chief, editor and writer of texts regarding Europe: Elina Helander-Renvall
Editor and writer of texts regarding North America: Kirk Tyler
Editor and writer of texts regarding Russia: Inkeri Markkula
Maps: Johanna Roto

Writers of the different chapters are:
Chapter 1: Elina Helander-Renvall
Chapter 2: Elina Helander-Renvall & Inkeri Markkula
Chapter 3: Kaisa Pohjoismäki
Chapter 4: Elina Helander-Renvall, Inkeri Markkula & Kirk Tyler
Chapter 5: Elina Helander-Renvall, Inkeri Markkula & Kirk Tyler
Chapter 6: Elina Helander-Renvall & Kirk Tyler

Contributing authors and experts:
Alexander, Merle:
4.2.6: Case Study - Development of the Kaska Traditional Knowledge Network (KTKN) – Kaska Nation, Canada. (From: Kaska Nation: Development of a Traditional Knowledge Network – Empowerment by Knowledge.)
4.2.8: Indigenous customary law. (From: Aboriginal Customary Law: Reconciling the Savage with the Civilized.)

Bocharnikov, Vladimir:
4.2.2: Case Study - Existing national policy and legal framework in Russia. (From: An Assessment of the Implementation of the Russian Government's International Commitments on Traditional Forest-Related Knowledge from the Perspective of Indigenous Peoples.)
5.1.1: Text on Russia. (From: An Assessment of the Implementation of the Russian Government's International Commitments on Traditional Forest-Related Knowledge from the Perspective of Indigenous Peoples.)
5.1.3: Case study - Samarga - Traditional ways for the Udege (Russia). (From: Samarga: Traditional Ways for the Udege or a Forest Desert of the Future?)
5.1.4: Text on Russia. (From: An Assessment of the Implementation of the Russian Government's International Commitments on Traditional Forest-Related Knowledge from the Perspective of Indigenous Peoples.)

Ford, Violet:
4.2.2: Text on Labrador Inuit Land Claims and Nunavut Wildlife Act.
4.2.4: Text on Sanikiluaq.
4.2.6: Text on the Inuvialuit Land Claims Area.
5.1.2: The intellectual property rights legislation in Canada.
(From: Legislative Measures and Canadian Arctic: The Investigation of Status and Trends of Traditional Biodiversity Related Knowledge in the Arctic Regions.)

Kafarowski, Joanna:
4.1.9: Gender and traditional knowledge in the circumpolar North. (From: Gender and Traditional Knowledge in the Circumpolar North.)

Lukin, Karin:
4.1.4: Text on Kolguev Island. (From: Land Use and Nenets in the Kolguev Island – Russia.)

Markkula, Inkeri:
4.1.2: The meaning of birch. (From: The Meaning of Birch.)

McBeath, Jerry & Carl Sherpo:
4.1.5: Case study - Environmental Change in the North – North Slope, Alaska. (From Environmental Change in the North: Evaluation Using Local Cultural Perceptions.)

Mustonen, Kaisu & Tero Mustonen:
4.1.1: Text on dreaming and hunting. (From: Sakha Republic Biodiversity and Local Knowledge.)
4.1.3: Text on shamanism. (From: A Special View on Shamanism and Spirituality Shamanism in Yakutia.)

4.2.3: Case study – Protecting biological diversity in the Sakha Republic – Russia. (From: Sakha Republic Biodiversity and Local Knowledge.)
5.1.3: Text on the traditional economies in Sakha Republic. (From: Sakha Republic Biodiversity and Local Knowledge.)
5.1.4: Text on Nizhnikolymsky and Chersky Russia. (From: Sakha Republic Biodiversity and Local Knowledge.)
5.1.5: Text on Alexei Gravrilovich Tretjakov. (From: Sakha Republic Biodiversity and Local Knowledge.)

Mustonen, Tero & Sergey Zavalov:
4.1.5: Case study - Kola Peninsula, Sami climate change and species observations. (From: Kola Peninsula, Sami Climate Change and Species Observations.)

Šarahmatova, Viktoria:
4.1.4: Text on Experiences of co-management in Kamtšatka region and Koryak autonomous regions – Russia. (From: Experiences of Development of Indigenous Co-Management in the Kamtšatka Region and Koryak Autonomous Region. In Helander Elina & Mustonen Tero (eds.). Snowscapes, Dreamscapes: Snowchange Book on Community Voices of Change.)

Vlassova, Tatiana:
4.1.6: Text on the Arctic Residents Network of Socio-Economic Assessment and Education for Sustainable development (ARN).
4.1.8: Text on Russia.
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