CHAPTER 9

FOOD SECURITY IN THE ARCTIC AND INTERNATIONAL ENVIRONMENTAL LAW: A GENERAL FRAMEWORK

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Abstract: It is impossible to guarantee food security in the Arctic if problems relating to the protection of the environment on the one hand, and the promotion of a sustainable development on the other, are not taken into consideration by governments and people. As major sources of pollution in the Arctic originate both within and outside the region, the eight Arctic countries must work together to address common concerns. While global problems like the depletion of the ozone layer, transboundary air pollution, and global warming require global solutions, the establishment of regional programs seems more appropriate to solve problems particular to Arctic countries. From the standpoint of international law, environmental problems and problems relating to sustainable development transcend national boundaries. The role of international law is to provide mechanisms to facilitate cooperation between nation states, negotiate the legal norms, regulate the use of resources, settle disputes, supervise implementation of treaties and amend existing treaties through the introduction of new norms. The object of this chapter is to portray the general framework of international environmental law applicable to the Arctic. As regards problems specific to the circumpolar region, there exists a substantial body of instruments that deal with various aspects of the Arctic environment. In the final report, an attempt will be made to measure the effectiveness of existing treaties and identify the legal gaps to be filled in order to assure food security in the Arctic.

> *Arctic ecosystems are unique in the sense that anthropogenic impacts are still at a relatively low level compared with most other parts of the earth where human settlements are more dense and development activities are more intensive.* Program for the Conservation of Arctic Flora and Fauna, Co-operative Strategy for the Conservation of Biological Diversity in the Arctic Region, 1997.

1. THE ROLE OF INTERNATIONAL LAW FOR THE PROTECTION OF THE ENVIRONMENT IN THE ARCTIC

In a recent Report (ICC 1997) the Inuit Circumpolar Conference notes that 'lots of families are relying increasingly on imported foods and products' and that the result is 'a change in consumption patterns, contributing to the erosion of traditional lifestyles and a decline in physical and spiritual health.' Changing consumption patterns may be caused by many factors, but these new patterns can surely be dictated by negative environmental impacts flowing from unsustainable human activities. For example, contamination of northern ecosystems by mercury, petroleum hydrocarbons, or pesticides can have devastating physical effects on Arctic fauna and flora, and ultimately on Inuit and their food consumption. In fact, it has been said that 'the negative effects of not eating country food [is] considered more serious than the possible accumulated risks of eating them' (DIAND 1997).

From the standpoint of international law, environmental problems are those that transcend national boundaries. As section 9 of the Arctic Environmental Protection Strategy states: "the problems facing Arctic flora, fauna and habitats are not confined to any one country but are circumpolar in nature." One may add that the Arctic region is also a part of the Earth and is as vulnerable as any other region to the effects of global problems like climatic changes, and air and water pollution. Nobody could seriously argue that Arctic States alone can minimize releases of persistent organic pollutants (POPs) like pesticides, industrial chemicals and industrial by-products because they are produced outside the Arctic region and move freely across the

globe. As a matter of fact, it is generally said that many of the threats to the Arctic come from activities far outside the region; if it is so, we must conclude that sound management of these problems becomes dependent on the promotion of the Arctic's interests in other regional or global organizations. In these circumstances, it is easy to recognize that the right answers to these problems must come from international cooperation through international law.

International law may be defined as the body of rules and principles of action that are binding upon States in their relations with each other (cf. Brierly 1963). The sources of modern international law are treaties, international custom as evidence of a general practice accepted as law, general principles of law and judicial decisions. International environmental law is no more than a specialized branch of international law and is at a very early stage of development, as is the science of the environment in general. Nevertheless, there is a considerable body of treaties and principles in the field of the environment and many of them are directly applicable to the Arctic. International environmental law deals not only with pollution problems which are its traditional field; it is more and more concerned with sustainable development and, consequently, with the sound management of living resources, both marine and terrestrial, and non-living resources. The role of the law in achieving sustainable development is important because it provides mechanisms for negotiating norms, regulating the use of resources, settling disputes, and supervising the implementation of treaties.

2. SUSTAINABLE DEVELOPMENT

Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. A more precise definition is given by a Canadian federal law—*The Auditor General Act*—which establishes the Commissioner of the Environment and Sustainable Development. The Commissioner is appointed by the Auditor General, and must report directly to him on the progress of government departments toward sustainable development. The *Auditor General Act* states expressly that sustainable development is "a continually evolving concept based on the integration of social, economic, and environmental concerns, and which may be achieved by, among other things, (a) the integration of the environment and the economy; (b) protecting the health of Canadians; (c) protecting ecosystems; (d) meeting international obligations; (e) promoting equity; (f) an integrated approach to planning and making decisions that takes into account the environmental and natural resource costs of different economic options and the economic costs of different environmental and natural resource options; (g) preventing pollution; and (h) respect for nature and the needs of future generations." It follows from this that there is no conflict between environment and sustainable development and no theoretical need to draw a distinction between these two concepts. However, it is always important to keep in mind that the protection of resources goes beyond strict no-pollution activity; indeed, one of the most difficult issues is whether it is possible to prevent a massive depletion of natural resources by creating legal regimes which set limits to exploitation.

3. GLOBAL AND REGIONAL PROBLEMS

The existence of global problems (Section 1) implies that cooperation at the global level is necessary to solve these issues. In 1991, the Arctic States identified 26 general treaties that are applicable to the Arctic[1]. Three global problems correspond to the three major elements of environment: air pollution (1.1); protection of fauna and flora (1.2); marine pollution (1.3). Regional problems (Section 2) are those that can be addressed by Arctic States through bilateral or plurilateral cooperation. The most important issue that must be resolved is the extent to which the analysis of global problems should be covered in the present research project[2].

Two general problems must be addressed relative to this research. The first is to get a clear picture of the present state of general environmental conventions on the one hand, and of special conventions relating to Arctic region on the other. The object of this inquiry is to measure the effectiveness of established treaties. The second is to analyze what needs to be done in the future to have the right solutions to problems relating to food security. This latter inquiry implies that we have a good understanding of the real problems that confront Arctic

[1] *List of major international instruments and policy declarations pertaining to the Arctic environment.* Rovaniemi, June 1991.

[2] For example, the North Pacific Anadromous Fish Commission (NPAFC) is studying the effects of climate and ocean conditions on salmon production in the North Pacific Ocean, and no one could argue it is unimportant. Scientists are working on models in order to predict how changing climates could affect the population of the Porcupine Caribou Herd over a ten-year period.

people; it is essential because it will tell us why an existing treaty should be amended, or a new one adopted.

3.1 Global Problems

Principle 21 of the *Stockholm Declaration on the Human Environment* (1972) and Principle 1 of the *Rio Declaration on Environment and Development* (1992) affirm the sovereign right of States to exploit their own resources, pursuant to their own environmental policies. The only limit to this sovereign right is that they must do everything to ensure that their activities do not cause damage to other States' environments. This means that they have the duty to prevent environmental harm and to cooperate with each other in mitigating transboundary environmental risks. Cooperation through multilateral or bilateral treaties is therefore essential to prevent or eliminate adverse environmental effects. Major international treaties have been adopted for various sectors like air pollution (1.1), marine pollution (1.2), and the protection of fauna and flora (1.3).

3.1.1 Air pollution

Air pollution" means *the introduction by man, directly or indirectly, of substances or energy into the air, resulting in deleterious effects of such a nature as to endanger human health, harm living resources and ecosystems and material property, and impair or interfere with amenities and other legitimate uses of the environment.* When we talk about air pollution, we refer to various problems such as transboundary air pollution (1.1.1), global warming (1.1.2) and depletion of stratospheric ozone (1.1.3).

Transboundary air pollution. Transboundary air pollution means air pollution whose physical origin is situated wholly or in part within the area under the national jurisdiction of one State, and which has adverse effects in the area under the jurisdiction of another State, at such a distance that it is not generally possible to distinguish the contribution of individual emission sources or groups of sources[3]. International law[4] recognizes that the predominant sources of air pollution contributing to the acidification of the environment are the combustion of fossil fuels for energy production, and the main technological processes in various industrial sectors, as well as transport, which lead to sulphur, nitrogen oxides and other pollutant emissions. It also recognizes that sulphur emissions and other air pollutants continue to be transported across international boundaries and, in exposed parts of Europe and North America, are causing widespread damage to natural resources of vital environmental and economic importance such as forests, soils and waters, and under certain circumstances, have harmful effects on human health. In the same manner, international conventions recognize that emissions of some heavy metals and many persistent organic pollutants are transported across international boundaries and deposited far from their site of origin.

The *Convention on Long-Range Transboundary Air Pollution* is the first international agreement where the Contracting Parties have to limit, on a broad regional basis and as far as possible, gradually reduce and prevent air pollution, including long-range transboundary pollution. The *Convention* was adopted in Geneva in 1979 as a result of a European policy on air pollution, when the interrelationship between sulphur emissions in continental Europe and the acidification of Scandinavian lakes was established; it was also ratified by Canada and the USA. It has been in force since 1983; over 40 States are now parties to that Convention which appears as a first move to control air pollution and initiate imperative international cooperation. Seven protocols have been adopted since 1983 in order to complete the Convention.

The first is the 1984 *Geneva Protocol on long-term financing of the cooperative program for monitoring and evaluation of the long-range transmission of air pollutants in Europe*[5] (EMEP).

The second is *the Protocol on the reduction of sulphur emissions or their transboundary fluxes*[6] *by at least 30%*, adopted in Helsinki in 1985 and in force since 1987, in which Parties to the agreement undertook to reduce their national annual sulfur emissions or their transboundary fluxes by at least 30 per cent as soon as

[3] The 1979 Convention on long-range transboundary air pollution.

[4] See: the 1994 Oslo Protocol on further reduction of sulphur emissions.

[5] The Protocol is an instrument for international cost-sharing of a monitoring program for review of relevant air pollution in Europe in light of agreements on emission reduction. EMEP has three main components: collection of emission data for SO_2, NOx, VOCs and other air pollutants; measurement of air and precipitation quality and modeling of atmospheric dispersion. At present, about 100 monitoring stations in 24 ECE countries participate in the program.

[6] [1988] 21 ILM 707.

possible and at the latest by 1993, using 1980 levels as the basis for calculation of reductions. It would seem[7] that the Protocol was a real success, since the 21 Parties reduced 1980-level sulphur emissions by more than 50%. The *Protocol* was replaced in 1994 by the *Oslo Protocol on further reduction of sulphur emissions* whereby the Parties agree to reduce their sulphur emissions in order to protect human health and the environment from adverse effects, particularly acidifying effects, and ensure that deposition of oxidized sulphur compounds do not exceed critical loads[8] in the long term. Each Party agreed to reduce and maintain its annual emissions in accordance with the timing and levels it accepted; this led to a differentiation of emission reduction obligations.

The fourth protocol is the *Sofia Protocol concerning the control of emissions of nitrogen oxides or their transboundary fluxes*, adopted in 1988. Fossil fuel combustion is the main source of anthropogenic NOx emissions from such stationary sources as public power, cogeneration and district heating plants, and industrial combustion plants. This *Protocol* requires the Parties to stabilize their nitrogens oxide emissions or their transboundary fluxes at 1987 levels by 1994. The Parties must also make unleaded fuel sufficiently available, in particular cases as a minimum, along main international transit routes, to facilitate the circulation of vehicles equipped with catalytic converters.

The fifth protocol was adopted in 1991 in Geneva in order to control a major air pollutants and nitrogen oxides, responsible for ground level ozone or tropospheric ozone; it is the *Geneva Protocol concerning the control of emissions of volatile organic compounds*[9] *or their transboundary fluxes.* This Protocol, enforced on September 29, 1997, requires States to choose between two major options for reducing hydrocarbons by 30% by 1999 using data from any year between 1984 and 1989 or reducing by 30% within a Tropospheric Ozone Management Area in order to ensure that by 1999, the total national emissions do not exceed 1988 levels. For a few countries like Bulgaria, Greece, and Hungary, where emissions in 1988 did not exceed certain specified levels, States may opt for stabilization at that level of emission by 1999.

The sixth protocol relates to Persistent Organic Pollutants and was signed in Oslo, in June of 1998. It pertains mainly to pesticides and some industrial chemicals like PCBs. This *Protocol* recognizes that emissions of many persistent organic pollutants are transported across international boundaries and deposited in Europe, North America and the Arctic, that the Arctic ecosystems and its indigenous people who subsist on Arctic fish and mammals are particularly at risk because of the biomagnification of POPs. The basic obligations of States are to eliminate the production and use of substances listed in Annex 1 (Aldrin, Chlordane, Chlordecone, DDT, Dieldrin, Endrin, Heptachlor, Hexabromobiphenyl, Hexachlorobenzene, Mirex, PCB and Toxaphene), restrict substances listed in Annex 2 to the uses described (DDT, HCH, PCB), and reduce total annual emissions of each of the substances listed in Annex 111 (PAHs, Dioxins/furans and Hexachlorobenzene) to the levels of 1990 or any other year between 1985 and 1995 specified by a Party upon ratification.

The seventh protocol relates to heavy metals and was signed in Aarhus, Danemark, on June 24, 1998. The goal of the *Aarhus Protocol on Heavy Metals* is to control emissions of heavy metals caused by anthropogenic activities subject to long-range transboundary atmospheric transport and likely to have significant adverse effects on human health or the environment. According to Article 3, each Party shall reduce its total annual emissions into the atmosphere of each of the heavy metals listed in Annex I from the level of the emission in the reference year, set in accordance with that annex by taking effective measures, appropriate to its particular circumstances. Three metals are the objects of this requirement: cadmium, lead, and mercury. The Parties will have to reduce their emissions to below their levels of 1990 or any alternative year between 1985 and 1995 specified by a party upon ratification. Iron and steel industry, combustion processes like power generation, road transport and waste incineration are the major activities that fall under the *Protocol.*

In 1991, Canada and the USA signed an *Agreement on Air Quality* that includes reductions in SO_2 and NO emissions; the International Joint Commission supervises implementation of this agreement.

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[7] UN/ECE, The Protocol on the reduction of sulphur emissions, http:www.unece.org/en/sulf_h1.htm.

[8] 'Critical load' refers to a quantitative estimate of an exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur, according to present knowledge. Road transport is a major source of anthropogenic VOC emissions, the largest source being the petrol-fueled vehicle.

[9] The Protocol defines VOCs as any organic compound of anthropogenic nature, other than methane, producing photochemicals oxidants by reaction with nitrogen oxides in the presence of sunlight.

The *Draft Convention on Persistant Organic Pollutants* (POP's). In June of 1998 in Montreal, a majority of States began the first round of talks related to an international agreement on POP's; negotiations are held under the UNEP umbrella and are expected to be concluded by the year 2000.[10]

The *Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in international Trade* (PIC). This *Convention*, adopted in Rotterdam on 10 September 1998, was signed by 62 States. Its goal is to control international trade in such dangerous substances as toxic pesticides and other chemicals, many of which are persistent organic pollutants. Article 1 states that the objective is "to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment". It covers pesticides and industrial[11] chemicals that have been banned or severely restricted for health or environmental reasons by those States party to the agreement. Article 12 declares that "where a chemical that is banned or severely restricted by a Party is exported from its territory, that Party shall provide an export notification to the importing country;" it must also give all the necessary information with regard to risks to human health and the environment. When exported, hazardous chemicals must be packaged and labeled in a manner that is adequately protective of human health and the environment.

3.1.2 Global warming

The preamble of the 1992 *United Nations Framework Convention on Climate Change* recognizes that human activities have been substantially increasing atmospheric concentrations of greenhouses gases and that this will result, on average, in an additional warming of the Earth's surface and atmosphere. Its ultimate objective is to achieve stabilization of greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate system. The *Convention*, now[12] ratified by 176 States, does not fix binding emissions targets for any country to reduce greenhouse gases, but in December 1997, industrial countries and countries with economies in transition[13] adopted the *Kyoto Protocol*[14] where they accepted binding reduction emissions. Together, industrial countries must reduce their emissions of six greenhouses gases (carbon dioxide, methane, nitrous oxides, HFC's, PFC's, and sulfur hexafluorides) by at least 5% below 1990 levels over the commitment period (2008-2012).

3.1.3 Stratospheric ozone depletion

The thinning of the ozone layer is a global problem; it results not only in higher risks for skin cancer, cataracts, damage to the immune system in humans; but higher risks for marine food chains, a warming of the earth's surface, and negative impacts on the Arctic ecosystems as new evidence have emerged about the state of the ozone layer over the Arctic. With the 1985 *Vienna Convention for the protection of the ozone layer*, States agreed to take appropriate measures to protect the environment against adverse effects likely to result from human activities that modify the ozone layer, but did not specify any concrete measure to achieve that objective. By the 1987 *Montreal Protocol on substances that deplete the ozone layer*, following the discovery of the Antarctic ozone hole, the States decided to reduce and finally eliminate CFCs; by a series of amendments made in London in 1990, Copenhagen in 1992, Vienna in 1995 and Montreal in 1997, those industrial States party to the *Protocol* systematically took action to reinforce their obligations, progress in the objective of eliminate CFC production and incorporate new substances other than CFCs in the *Protocol*[15] that produce negative effects on

[10] According to UNEP, the 12 POPs requiring the most urgent action are: Aldrin, Chlordane, DDT, Dieldrin, Dioxins, Endrin, Furans, Heptachlor, Hexachlorobenzene, Mirex, Polychklorinated Biphenyls (PCBs) Toxaphene.

[11] These pesticides are listed in Annex III: 2,4,5-T; aldrin; captafol; chlordane; chlordimeform; chlorobenzilate; DD; dieldrin diniseb; 1,2-dibromoethane fluoroacetamine; HCH; heptachlor; hexachlorobenzene; lindan; pentachlorophenol; methamidophos; phosphamidon; methyl-parathion; parathion; crocidolite; polybrominated bihenyls.

[12] As of October 7, 1998.

[13] Hungary, Poland, Slovakia, Romania, Croatia, Lithuania, Slovenia, and Ukraine.

[14] This *Protocol* will become effective once it is ratified by at least 55 States, which represent at least 55% of the total carbon dioxide emissions of indusrial countries, i.e, sometime after the year 2000. As of March 16, 1999, 84 parties (including the European Community) have signed it.

[15] These new subtances are: halons, carbon tetrachloride, methyl chloroform, hydrochlorofluorocarbons, hydrobromofluorocarbons, methyl bromide

the ozone layer. Under the 1987 *Montreal Protocol* and its amendments, governments have agreed to phase out CFCs, halons and other chemicals that destroy ozone in the stratosphere. As a matter of fact, CFC production facilities are closing down, and it is expected that the ozone layer will fully recover some time in the 21st century if the *Protocol* continues to be effectively enforced[16]. Consequently, it can be said that the CFC problem is now under control.

3.1.4 Protection of fauna and flora

Two general international conventions must be considered when we analyze the protection of wild fauna and flora. The first is the *Convention on international trade in endangered species of wild fauna and flora*, which is founded on the narrow idea that the international wildlife trade is responsible for over-exploitation of wild fauna and flora and threatens the survival of species. The second is the 1992 *Convention on biological diversity*; founded on the broader idea that the conservation of biological diversity is of common concern to humankind and that it is vital to prevent and attack the causes of loss of biological diversity at the source. Three other treaties deserve mention: the *Convention on wetlands of international importance* (Ramsar 1971), the *Convention concerning the protection of the world cultural and natural heritage* (Paris 1972) and the *Convention on conservation of migratory species of wild animals* (Bonn 1979).

Endangered species. The *Convention on international trade in endangered species of wild fauna and flora*[17] (CITES) was adopted in 1973. As the wildlife trade is a highly lucrative business, it is thought that it has caused important declines in the numbers of many species of animals and plants. By this *Convention*, States party to the agreement accept to ban commercial international trade for an agreed list of endangered species (Annex 1) and regulate trade in others species that might become endangered (Annex II). Annex III includes a list of all species that any Party has identified as being subject to regulation within its jurisdiction for the purpose of preventing or restricting its exploitation.

The most endangered species are listed in Annex I and include all species threatened with extinction, which are or may be affected by trade; there are more than 800 species on this list[18]. The export of any specimen of a species included in Appendix I require an export permit. An export permit shall only be granted when specific conditions have been met, particularly when the State Scientific Authority has advised that such export will not be detrimental to the survival of that species, and when the State Management Authority is satisfied that an import permit has been obtained for the specimen. The import of any specimen of a species included in Appendix I requires an import permit, and either an export permit or a re-export certificate. An import permit will only be granted when specific conditions have been met, more particularly when a State Scientific Authority has advised that the import will be for purposes, which are not detrimental to the survival of the species involved, and when the State Management Authority is satisfied that the specimen is not to be used for primarily commercial purposes.

Appendix II includes all species, which, although they may not currently be threatened with extinction, may become so unless trade is subject to strict regulation; there are about 3,000 species in this category[19]. The export of any specimen of a species included in Appendix II requires an export permit. An export permit will only be granted when the State Scientific Authority has advised that such export will not be detrimental to the survival of that species. The import of any specimen of a species included in Appendix II requires an export permit or a re-export certificate.

The export of any specimen of a species[20] included in Appendix III from any State, which has included that species in Appendix III requires an export permit. An export permitwill only be granted when a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora; the import of any specimen of a species included in

[16] There is a problem of non-compliance on the part of eight countries which were Members of the former Soviet Union; as a matter of fact, it appears that these countries have been unable to meet their phase-out schedules due to their recent transition to market economies.

[17] U.N.T.S. no 993, p.243. The *Convention* entered into force on July 1, 1975 and 145 States are legally bound by it.

[18] As of 23-03-1999, there are 219 species of mammals, 145 species of birds, 62 species of reptiles, 13 species of amphibians, 8 species of fish, 64 species of invertebrates, 310 species plants and many subspecies.

[19] Mammals: 364; birds: 1263; reptiles :383; amphibians: 68; fish:28; invertebrates:2006; plants: 2481 (as of 23-03-1999).

[20] About 229 species and 11 subspecies as of 23-03-1999.

Appendix III requires the presentation of a certificate of origin and, where the import is from a State which has included that species in Appendix III, an export permit.

Migratory species. Many species of wild animals migrate across or outside national jurisdictional boundaries and their conservation requires the concerted action of all interested States.

The *Convention on conservation of migratory species of wild animals*, which is open to all States, was signed at Bonn in 1979 and entered in force in 1983. The parties to the agreement must prohibit, on their territory, the taking of animals, which are endangered, except for scientific purposes or for the needs of traditional subsistence users. As for non-endangered animals, Parties are invited to conclude international agreements for their conservation and management. The *Bonn Agreement* defines general guidelines on the subject. A few agreements were adopted later on by parties; two are of immediate interest for our report: the *Agreement on the conservation of the Baltic and North Seas* (1991) and the *Agreement on the conservation of seals in the Wadden Sea* (1990).

Biological diversity. The *Convention on Biological Diversity,* adopted in 1992 at the Rio Summit, has been in force since December 29, 1993 and binds almost all States. The *Convention* has three objectives: the conservation of biological diversity,[21] the sustainable use of biological resources and the fair sharing of the benefits arising from the use of genetic resources. Each party to the agreement must: develop national strategies, plans, and programmes for the conservation of biological diversity; identify processes and activities which have significant adverse impacts; establish a system of protected areas where special measures need to be taken; support local populations to develop remedial action in degraded areas; and, introduce appropriate procedures requiring environmental impact assessment of proposed projects that could have negative impacts.

Wetlands. The *Convention on wetlands of international importance especially as waterfowl habitat*[22] (Ramsar 1971) is based on the fact that wetlands[23] have "fundamental ecological functions as regulators of water regimes and as habitats supporting a characteristic flora and fauna, especially waterfowl." Ratified by all Arctic Countries, it requires States to designate suitable wetlands within their territory for inclusion in a "List of Wetlands of International Importance." The contracting parties have a duty to promote the conservation of the wetlands included in the Ramsar List. Canada has listed several sites in the Northwest Territories and in Yukon, including Polar Bear Pass, Rasmussen Lowlands, Old Crow Flats, and Queen Maud Gulf.

Natural heritage. The protection of the cultural and natural heritage of outstanding universal value is the purpose of the *Convention concerning the protection of the world cultural and natural heritage* (Paris 1972), which was adopted by more than 150 States. Each party to the agreement may identify natural features consisting of physical and biological formations or natural sites for registration on the World Heritage List; managed by the World Heritage Committee that decides on approvals. According to the *Operational Guidelines,*[24] sites must satisfy selection criteria in order to be included. A natural site, for example, may be selected if it "contain[s] the most important and significant natural habitats for *in situ* conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation." Once a site is on that List, the interested State recognizes its duty to protect this site, if necessary, with international assistance through the World Heritage Fund. More than one hundred natural sites have been selected around the world. In Canada, Nahanni National Park in the Northwest Territories and Kluane National Park Reserve in the Yukon and British Columbia's

[21] Biological diversity, according to the convention, 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."

[22] 996 UNTS 245

[23] For the purpose of the *Convention* wetlands are "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres." Waterfowl are birds ecologically dependent on wetlands.

[24] United Nations Educational, Scientific and Cultural Organization, Convention Concerning the Protection of the World Cultural and Natural Heritage Operational Guidelines for the Implementation of the World Heritage Convention.

Tatshenshini-Alsek Park are included in this network. The Lapponian Area in northern Sweden, is also a World Heritage Site; it includes four national parks and many Saami communities that use the area for herding and grazing within the site.

3.1.5 Marine environment

Land-based sources contribute 70% of marine pollution, while maritime transport and dumping-at-sea activities contribute 10% each. According to the Inuit Circumpolar Conference (1997) the contaminants posing the greatest threats to the marine environment are: sewage, nutrient, synthetic organic compounds, sediments, litter and plastic, metals, radionuclides, oil and hydrocarbons and policyclic aromatic hydrocarbons (PAHs). But pollution is not the only problem to solve in managing marine resources on the basis of sustainable development. Problems due to excessive fleet size and to overfishing are frequently seen as real barriers. For many years, international law has addressed both pollution issues (Section 1.3.1) and overfishing (Section 1.3.2).

Pollution issues. At its twenty-eighth session, held in Geneva from April 20 to 24, 1998, the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection[25] (GESAMP) issued a statement included as Annex X to its Report.[26] GESAMP observed that *despite some localized successes, degradation of the oceans continues on a global scale.* From a legal standpoint, this is quite astonishing because for thirty years now, a great number of international conventions and protocols have been adopted in order to prevent and reduce different sources of marine pollution. It would seem that the challenge lies more in the implementation of all these conventions by all States than in the creation of new rules.

General framework. The 1982 *United Nations Convention on the Law of the Sea* (UNCLOS) provides the legal basis upon which States can work to pursue sustainable development of the marine resources and protection of the marine environment. As the UN Secretary General[27] put it, the Convention is "the first comprehensive statement of international law on the issue" of marine pollution. The environmental provisions of UNCLOS are important , but they are not unique; indeed, they are completed by many other international conventions, such as the 1972 *Convention on the prevention of marine pollution by dumping of wastes,* the 1973/1978 *Convention for the prevention of pollution from ships* (Marpol) and the 1969 *International Convention relating to intervention on the High Seas in cases of oil pollution casualties.* Several general conventions have been adopted for regional seas.[28]

Articles 192 to 237 of UNCLOS relate to the protection and preservation of the marine environment. It is generally recognized in customary international law that individual States have the sovereign right to exploit their natural resources pursuant to their environmental policies, but they also have the fundamental and general obligation to protect and preserve the marine environment, and must take any step necessary to prevent, reduce and control pollution from any source.

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[25] GESAMP is an expert scientific advisory body established in 1969 within the United Nations system whose mandate is to provide scientific advice concerning prevention of the marine pollution; it is supported by the United Nations, UNEP, UNESCO/IOC, FAO, WHO,WMO, IMO and IAEA.

[26] GESAMP, Reports and Studies No. 66.

[27] UN General Assembly, Report of the Secretary-General, Protection and preservation of the marine environment, A/44/461 Forty-fourth Session, 18 September 1989.

[28] The following conventions have been adopted under the Regional Seas Program of the United Nations Environment Program (UNEP): 1976 *Convention for the Protection of the Mediterranean Sea against Pollution* (Barcelona Convention); 1978 *Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution* (Kuwait Convention); 1981 *Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region* (Abidjan Convention); 1981 *Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific* (Lima Convention); 1982 *Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment* (Jeddah Convention); 1983 *Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region* (Cartagena Convention); 1985 *Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region* (Nairobi Convention); and 1986 *Convention for the Protection and Development of Natural Resources and Environment of the South Pacific Region* (Noumea Convention). The Baltic Sea States in 1974 adopted a comprehensive *Convention on the Protection of the Marine Environment of the Baltic Sea Area* (Helsinki Convention). See also the 1969 *Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil* (1969 Bonn Agreement); the 1971 *Agreement between Denmark, Finland, Norway and Sweden concerning Co-operation in Measures to Deal with Pollution of the Sea by Oil* (Copenhagen Agreement) and the 1983 *Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil and Other Harmful Substances* (1983 Bonn Agreement) .

They have the duty not only to protect the marine environment, but also to prevent the spreading of pollution beyond their own boundaries. First, they must adopt laws and regulations to prevent, reduce and control pollution from: land-based sources, including rivers, estuaries, pipelines and outfall structures; those arising from or in connection with sea-bed activities subject to their national jurisdiction; by dumping; and, from vessels flying their flag.

Pollution from land-based sources. As everyone knows, the most serious sources of marine pollution are land based, such as discharges of untreated sewage and industrial effluents. Article 207 of UNCLOS says that State actions must endeavour to "establish global and regional rules, standards and recommended practices and procedures to prevent, reduce and control pollution of the marine environment from land-based sources, taking into account characteristic regional features, the economic capacity of developing States, and their need for economic development". There is no global convention on the subject, but UNEP did elaborate in 1985 some general guidelines to help in negotiation of international treaties. These guideline *the Montreal Guidelines for the Protection of the Marine Environment against Pollution from Land-based Sources*—could be the first path to a global convention. UNEP in 1995 elaborated a *Global Program of Action*[29] *for the Protection of the Marine Environment from Land-based Activities.* As the problem of land-based pollution seems easier to solve at a regional level, three regional treaties have been adopted: the 1974 *Paris Convention for the prevention of marine pollution from land-based sources*[30]; the 1980 *Protocol to the Barcelona Convention for the protection of the Mediterranean Sea against pollution from land-based sources* and the 1983 *Protocol to the Lima Convention for the protection of the South-East Pacific against pollution from land-based sources.*

Pollution from off-shore installations. Exploration for and exploitation of offshore oil and gas resources have taken place everywhere. Article 208 of UNCLOS requires the coastal State to adopt laws and regulations and to take the necessary measures to prevent, reduce, and control pollution of the marine environment from these installations. There is no international convention for the prevention of pollution from offshore oil and gas exploration and exploitation installations. Article 60 of UNCLOS requires States to remove any installation or structure that isabandoned or disused, taking into account any generally accepted international standards established in this regard by the competent international organization. According to the definition of dumping in Article 1 of the *UNCLOS Convention*, and of the definition of the same term in the 1973 *London Convention*, the dumping at sea of an old installation is still a legal activity. Yet, IMO has adopted in 1989 *Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone,*[31] which provide that no installation or structure should be placed on any continental shelf on or after January 1, 1998 unless its design and construction is such that entire removal upon abandonment or permanent disuse would be feasible. Decisions by contracting parties under regional conventions, such as the 1992 *Convention on the Protection of the Marine Environment of the Baltic Sea Area* and the 1992 *Convention for the Protection of the Marine Environment of the North-East Atlantic* prohibit the dumping of disused offshore installations.

Pollution by waste dumping. The *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters,*[32] adopted in London in 1972 has been in force since 1975. The eight Arctic countries are party to that Convention. Dumping has been defined as the deliberate disposal at sea of waste or other matter from vessels, aircraft, platforms or other man-made structures, as well as the deliberate disposal of these vessels or platforms themselves.[33] On the one hand, the Convention prohibits dumping of dangerous waste specifically enumerated in Annex I. On the other, it authorizes the dumping of certain waste products listed in Annex II, provided that a permit is issued by the State and that certain conditions are met; conditions that are outlined in Annex III. Important amendments were made to the *Convention* in 1993, and that have been in

[29] Adopted on November 3, 1995 by the Intergovernmental Conference, which met for that purpose in Washington, D.C., from October 23 to November 3, 1995. UNEP (OCA)/LBA/ IG.2/7 5 December 1995

[30] Replaced by the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR 1992).

[31] IMO Assembly resolution A.672(16).

[32] U.N.T.S. no 1046, p.120.

[33] Wastes derived from the exploration and exploitation of seabed mineral resources are excluded from the definition.

force since February 20, 1994, which ban dumping of low-level radioactive waste and dumping and the incineration of industrial waste at sea.

In November 1996, a new Protocol to the convention was adopted that represents a new philosophy, based on a precautionary approach to environmental protection, which leads to a complete ban on the dumping into the sea of industrial waste and low-level radioactive waste. Article IV states that all parties to the agreement "shall prohibit the dumping of any waste or other matter with the exception of those listed in Annex I." These are: dredged material; sewage sludge fish waste, or material resulting from industrial fish processing operations; vessels and platforms or other man-made structures at sea; inert, inorganic geological material; organic material of natural origin; and, bulky items primarily comprising iron, steel, concrete and similar unharmful materials for which the concern is physical impact and limited to those circumstances.

Pollution by ships. States are required by UNCLOS to establish rules and standards at the global level through the competent international organization, and, once they are generally accepted, to implement and enforce them at the national level. The most important treaty dealing with marine pollution from ships is *Marpol*, the *International Convention for the prevention of pollution from ships*, in force since February 10, 1983. The *Convention* was ratified by one hundred States whose combined merchant fleet represents 95% of world tonnage, and includes all Arctic Statesl. *Marpol* covers all aspects of pollution from ships, and applies to ships of all types; it has six Annexes, which contain regulations for the prevention of various forms of pollution. Any violation that occurs within the jurisdiction of any party to the *Convention* is punishable either under the law of the offended party or the law of the flag State.

The first two Annexes are binding upon all contracting parties. Annex I prohibits the deliberate discharge of oil or oily mixtures from all seagoing vessels,[34] in specific areas called prohibited zones; there is a general prohibition of discharge of any oil whatsoever from the cargo spaces of a tanker within 50 miles of the nearest land. Certain specific areas are considered to be so vulnerable to pollution by oil that oil discharges within them have been completely prohibited; these include the Mediterranean, the Black, the Baltic, and the Red seas and the Gulfs area. Outside these restricted areas, two important limitations apply: firstly, not more than 1/30,000 of the ship's total cargo-carrying capacity of oil may be discharged in a ballast voyage; second, the rate at which oil may be discharged cannot exceed 60 litres per mile traveled by the ship.

Annex II details the discharge criteria and measures for 250 noxious liquid substances (chemicals, for example) carried in bulk; no discharge of residues containing noxious substances is permitted within 12 miles of the nearest land.

The other Annexes (Annex III to VI) are optional. Annex III deals with pollution by harmful substances carried in packages, portable tanks, freight containers, or road or rail tank wagons; Annex IV concerns prevention of pollution by sewage; and, Annex V imposes a complete ban on dumping of plastic in any form. A new Annex (Annex VI), prohibits deliberate emissions of ozone-depleting substances, (which include halons and CFCs), and sets limits on the emissions of sulphur oxide and nitrogen oxide from ship exhaust; this new annex was adopted on September 26,1998, but it is not yet in force.

Finally, IMO has recently adopted *The Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens* in order to address the release of harmful aquatic organisms and pathogens from ships' ballast water. According to a Report by the United Nations Secretary-General, water taken on board for ballasting a vessel may contain aquatic organisms, which may cause harmful algae blooms after their release, or pathogens, which can have serious consequences for human health.[35]

Major oil pollution incidents. The *International Convention on Oil Pollution Preparedness, Response and Co-operation*,[36], signed in London in 1990, provides an international framework to combat oil pollution incidents and threats of marine pollution. Ships must carry an emergency plan and inform coastal authorities in case of oil spills. States parties are required to conclude bilateral or multilateral treaties to this end.

3.1.6 Conservation of marine resources

UNCLOS provisions. Both in the exclusive economic zone and high seas, States have the obligation to adopt conservation measures designed to maintain or restore

[34] Except tankers of under 150 tons gross and other ships of under 500 tons gross.

[35] (A/53/ 456) 1998.

[36] In force since May 13, 1995. 30 I.L.M. 733.

populations of harvested species at levels that can produce the maximum sustainable yield, as qualified by relevant environmental and economic factors. In the exclusive economic zone[37] the coastal State has sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living. At the same time, the coastal State must ensure that living resources are not endangered by over-exploitation. In the open seas, States must cooperate in the conservation and management of living resources, particularly when their nationals exploit identical or different resources in the same area. They are invited to establish subregional or regional fisheries organizations to this end.

The 1982 Convention contains specific provisions[38] for highly migratory species, marine mammals and anadromous stocks. With regard to marine mammals, States must co-operate with a view to their conservation; in the case of cetaceans, they must work through the appropriate international organizations for their conservation, management, and study.

The *International Convention for Regulation of Whaling*[39] (ICRW). This *Convention* was signed in Washington, D.C., in December 1946. Denmark, Finland, Norway, Russia, Sweden, and the USA are members of the International Whaling Commission, the organization responsible for the implementation of the agreement; Canada withdrew in 1982 and Iceland in 1991. The Convention aims for the protection of whales on a global basis; its main goal is to provide for the proper conservation of whale stocks and the orderly development of the whaling industry. Its preamble recognizes "the interest of the nations of the world in safeguarding for future generations the great natural resources represented by the whale stocks" and notes "that the history of whaling has seen over-fishing of one area after another and of one species of whale after another to such a degree that it is essential to protect all species of whales from further over-fishing." The International Whaling Commission, established by the Convention, was empowered to make regulations from time to time with respect to the conservation and utilization of whale resources by: designating protected and unprotected species; opening and closing seasons; opening and closing waters, including designating sanctuary areas; and, setting size limits for each species, etc.

Catch limits for all commercial whaling were set to zero in 1982; a moratorium that entered into force in 1986—and it is still in force. However, it does not affect aboriginal subsistence, which is allowed. Any State may object to any decision of the Commission; in which case the objecting State is not bound by the decision. Norway, for example, has used this right to set national limits for its coastal whaling operations for minke whales, but unilateral economic sanctions are may be used to compel an objecting State to withdraw its objection[40]. Finally, the convention authorizes any State to grant any of its nationals a special permit to kill whales for scientific research purposes; for example, Japan is relying on that provision to continue hunting minke whales in the Antarctic.

3.2 Transsectoral Problems

Wildlife, inland waters, oceans, air, forests, and wetlands may be considered as different sectors within the field of environment and are the object of specific agreements. Meanwhile, many activities can impact more than one sector and solutions to problems must include an integrated approach.

3.2.1 Toxic or dangerous wastes

It is estimated that human activities produce 400 million tons of dangerous wastes annually. The *Basel Convention on the Control of Tranboundary Movements of Hazardous Wastes and their Disposal* was adopted in 1989 to ensure that international trade of such dangerous waste is permitted only when conducted under conditions that do not endanger human health or the environment. Any party to the *Convention* has the right to prohibit imports of hazardous or other wastes for disposal in its territory, and should it decides so, other parties must not permit export of hazardous waste to the former hazardous such wastes, the exporting party must obtain, from the important state, consent in writing to the specific import.

3.2.2 Nuclear activities and nuclear waste

Many important treaties in the field of military or civilian nuclear activities have a direct impact on the

[37] The exclusive economic zone shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured.

[38] Articles 64, 65, and 66.

[39] U.N.T.S. no 161, p.74.

[40] See section 2.3.3.

Arctic environment, as well as any other region. The 1963 Treaty bans nuclear weapons tests in the atmosphere, outer space, and underwater.[41] In 1996, the *Comprehensive Nuclear-Test Ban Treaty* was opened to the signature of all States. With this treaty, which is not yet in force,[42] every State undertakes not to conduct any nuclear weapon-test explosion or nuclear explosion ion any area under its jurisdiction and control. In an interesting opinion delivered in July of 1996, the International Court of Justice[43] had to address the important question brought by the United Nations General Assembly: "is the threat or use of nuclear weapons in any circumstance permitted under international law?"' The Court recognizes[44] in its opinion "that the environment is under daily threat and that the use of nuclear weapons could constitute a catastrophe for the environment". It finds[45] that "while the existing international law relating to the protection and safeguarding of the environment does not specifically prohibit the use of nuclear weapons, it indicates important environmental factors that are properly to be taken into account in the context of the implementation of the principles and rules of the law applicable in armed conflict."

As to civilian uses of nuclear energy, two conventions were concluded in Vienna on September 26,1986, in the aftermath of Chernobyl accident; the first—*the Convention on Early notification of a nuclear Accident*—requires States Parties, when there is a nuclear accident within their territory, to provide relevant information to other Parties as early as possible in order to minimize negative consequences. The other—the *Convention on Assistance in the Case of a Nuclear Accident or Radiological emergency*—sets the international framework in order to facilitate the provision of assistance and to minimize negative consequences The 1994 *Convention on nuclear safety* sets standards for the construction, operation, and regulation of civilian power plants; the new 1998 *Convention on the safe management of radioactive waste* defines rules relating to the treatment and transportation of radioactive wastes.

3.2.3 Impact assessment

The *Convention on Environmental Impact Assessment in a Transboundary Context*[46] was signed at Espoo on February, 25, 1991 and entered in force[47] on September 10, 1997. It covers Europe and North America. Under the Convention, each Contracting Party must take all appropriate measures "to prevent, reduce and control significant adverse transboundary[48] environmental impact from proposed activities;" it must, for example, create an environmental impact assessment procedure for such activities and that procedure must allow for public participation and the preparation of documentation. In cases where a proposed activity is likely to cause a significant adverse transboundary impact, Article 3 of the *Convention* requires the Party of origin to notify any Party which it considers may be affected "as early as possible and no later than when informing its own public about that proposed activity." The Party proposing the project must enter into consultation with the affected Party concerning, *inter alia*, "the potential transboundary impact of the proposed activity and measures to reduce or eliminate its impact."[49] Article 15 of the *Convention* contains a general provision on dispute settlement bu such means as negotiations, arbitration, and an International Court of Justice.

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[41] 480 UNTS 43.

[42] As of March 30, 1999, 152 States signed the treaty and 33 ratified it.

[43] Legality of the threat or use of nuclear weapons, July 8, 1996.

[44] Parag.29.

[45] Parag.33. In its view, "States must take environmental considerations into account when assessing what is necessary and proportionate in the pursuit of legitimate military objectives. Respect for the environment is one of the elements that go to assessing whether an action is in conformity with the principles of necessity and proportionality" (parag. 30).

[46] 30 ILM 1069.

[47] 19 Parties only by 31 December 1997.

[48] According to the *Convention*, 'transboundary impact' refers tp "any impact, not exclusively of a global nature, within an area under the jurisdiction of a Party caused by a proposed activity, the physical origin of which is situated wholly or in part within the area under the jurisdiction of another Party."

[49] According to the *Convention*, consultations may relate to "possible alternatives to the proposed activity, including the no-action alternative and possible measures to mitigate significant adverse transboundary impact and to monitor the effects of such measures at the expense of the Party of origin".

3.3 Conclusion

A sudden climate change—such as global warming by 3-4 degrees Celsius—would have potentially wide-ranging effects on Arctic countries. Radiation release from vulnerable nuclear power plants are now considered one of the most serious potential environmental threats for the next decades; a nuclear accident in Eastern or Central Europe could contaminate land masses and waterways throughout Arctic countries. It is not certain whether these global problems should be analyzed within the framework of the current research project; but if we consider that many specific pollution issues of utmost importance for Arctic countries are originating from global sources, it might be unwise to discard them; the POP case tells us that the only way to reduce their emission would be to act at the global level. The negotiation of a POPs *Protocol to the Convention on LRTP* demonstrates the truth of that proposition.

4. REGIONAL OR CIRCUMPOLAR PROBLEMS

4.1 Environmental Problems in the Arctic and Strategies

4.1.1 Pollution issues

By the *Rovaniemi Declaration*, representatives of the eight Arctic States, in June of 1991, adopted the *Arctic Environmental Protection Strategy* (AEPS), which contains six specific pollution issues of particular concern to all Arctic States: persistent organic pollutants; oil pollution from shipping and oil exploration and exploitation; heavy metals like cadmium, mercury and lead; noise; radioactivity;[50] and, acidification. The *Nuuk Declaration* (1993) called on AMAP to review the effectiveness of international agreements on the ozone layer and climate change on a regular basis.

It is especially important to note that these problems are not specific to the Arctic. Marine pollution from land-based sources[51] or ships and dumping in seas, acid rains caused by acidifying gases, radioactive waste dumping into the seas, transboundary air pollution by SO_2 (sulphur dioxide), NOx (nitrogen oxides) and CO_2, ozone depletion by CFCs and other pollutants, conservation of marine living resources, loss of boilogical diversity, protection of endangered species—all have been well known around the world for many years. Arctic States, however, are just now beginning to understand the risks that these problems carry to cause important damages to the Arctic[52].

The *AMAP Report* (1997) written within the framework of the AEPS, contains a systematic review of contaminants sources and pathways in the Arctic: persistent organic pollutants; heavy metals and acidification (major problems which form distinct chapters); radioactivity; climate change; and, ozone depletion (also the object of a separate treatment). The report concludes that "[s]everal groups of people in the Arctic are highly exposed to environmental contaminants" (AMAP 1997:186) and to "higher level of radionuclides than people in the temperate zone" (AMAP 1997:186). The same report asserts that "mercury levels in some areas are high enough to put children's health at risk" (AMAP 1997:178) and that the exposure to radionuclides "is generally higher in the Arctic than in northern temperate latitudes." (AMAP 1997:79). It notes that "[h]igh deposition of sulfur affects water quality on the Kola Peninsula and in eastern Finnmark in Norway" (AMAP 1997:143). As for ozone depletion and climate change, it stresses that "[c]limate change is likely to be more pronounced in the Arctic than in other areas of the world." (AMAP 1997:169) and that "ozone depletion has been more severe in the polar regions than elsewhere in the world." (AMAP 1997:169) Climate change is viewed as an overriding threat to Arctic ecosystems, as it is to other ecosystems in the world. The *Nuuk Declaration on environment and development in the Arctic* notes that "[i]ncreased temperature and precipitation in the Arctic may result in dramatic ecological and socio-economic effects." It has been predicted (ICC 1997) that the Arctic will be one of the regions most affected by global warming which will affect the temperature of both land and sea, as much as 2 to 2 1/2 times the global average (Wein & Wein 1995:86) Finally, the risks related to greater activities in the exploitation and transportation

[50] The *Fourth International Conference on Environmental Radioactivity in the Arctic* will take place in Edinburgh, Scotland, on September 20-23, 1999, will focus on the transport and fluxes of radioactive elements through atmospheric, terrestrial and marine environments, consequences of nuclear accidents, nuclear safety, and waste management.

[51] Land-based sources include rivers, estuaries, pipelines, and outfall structures.

[52] As the literature from AMAP puts it: "the Arctic is one of the last areas of relatively pristine nature to remain on Earth. However, pollution is becoming more apparent in this region."

of oil and gas resources are discussed (AMAP 1997:145-147)

The threat to northern ecosystems and human health by toxic contaminants is now a priority concern for polar science (AMAP 1997) since *natural degradation processes are slowed by colder climatic conditions, reduced ultraviolet solar radiation and short growing seasons.*[53] For a small proportion, local resource extraction and processing facilities contribute to the problem, but contaminants like sulphur emissions, persistent organic pollutants, heavy metals and radionuclides emanate largely from outside the Arctic, notably from the coal-based industries in Europe and Asia;[54] aerosols and fine dust, known as Arctic haze[55] or ice fog, carry toxic and persistent substances from transboundary sources. Arctic haze seems to be prevalent in Alaska, the Canadian Arctic and Siberian towns.[56] Pollutants such as soot, acid-forming substances, polychlorinated biphenyls (PCB), pesticides, and heavy metals are present in the Arctic.

Toxic chemicals enter the Inuit food chain and water supply, contaminating wildlife and threatening human health. For example, lead and zinc from mines are absorbed by lichens, which are eaten by caribou. Cadmium, arsenic, lead, zinc copper chromium were found in species at the top of the food chain such as beluga and other marine mammals. Highly toxic substances such as DDTs, PCBs, and chlordane, have been discovered in significant levels in whale and seal tissues. It is not surprising that many Inuit have levels of PCBs, DDTs and other persistent organic pollutants[57] (POPs) in their blood and fatty tissues that are greater than the national average in Canada.[58] Finally, pollution produces negative effects such as the loss of vegetation and the acidification of lakes; it may also have substantial negative effects with respect to the development of domestic and export markets for country foods (AMAP 1997:7)

4.2 International Strategies

States may use bilateral or multilateral strategies to address pollution problems.

4.2.1 Bilateral Agreements

USA-Russia. There are some agreements between Arctic countries in the field of the environment. For example, the *Agreement on Cooperation in the Field of Environmental Protection*[59] was concluded in 1972 by the USA and the USSR. The parties agree to develop cooperation in environmental protection; Arctic and Subarctic ecological systems are designated as particular research areas. This was superseded in 1994 by a new Agreement;[60] a Joint US-Russian Committee on Cooperation was established to implement it. During the same year, another Agreement[61] was signed which recognizes the sensitivity of the Arctic environment and

[53] *Conservation of Arctic Flora and Fauna, Cooperative Strategy for the Conservation of Biological Diversity in the Arctic Region*, 1997.

[54] The *Canadian Arctic Contaminants Assessments Report* concludes that the primary source of contaminants in Canada's North is atmospheric transport from industrial and agricultural sources, primarily in Europe, Asia and North America. See: Department of Indian Affairs and Northern Development, 1997.

[55] Arctic haze is an "unusual reduction in visibility;" it consists of "sulfate, soot, and sometimes dust." See: AMAP 1997 Report, pp. 134-135

[56] According to David Caron. 1993. "Towards an Arctic Environmental Regime," *Ocean Development and International Law* 24: 377-392, "acidification in the Arctic has been recognized in the phenomenon of Arctic Haze which is a visible air pollution of suspended particular matter that scatters solar radiation."

[57] According to the *United Nations Environment Program*, exposure to very low doses of certain POPs can lead to cancer, damage to the central and peripheral nervous system, diseases of the immune system, reproductive disorders and interference with normal infant and child development. UNEP Chemicals, Press Release, First session of the intergovernmental negotiating Committee- Persistent Organic pollutants- June 29 to July 3, 1998- Montréal.

[58] According to AMAP, one quarter of Canadian Inuit women who eat large amounts of mammals exceed the tolerable daily intake mercury and for some Arctic populations, blood PCB levels are 2-4 times higher than southern populations.

[59] 23 U.S.T. 845; T.I.A.S. 7345. The Agreement was renegotiated in 1994.

[60] *Agreement between the United States and Russia on cooperation in the field of protection of the environment and natural resources*, with Annex. Signed and entered in force June 23, 1994.

[61] *Agreement between the United States and the Russian Federation on Cooperation in the Prevention of Pollution of the Environment in the Arctic*, signed in Moscow, Dec.16, 1994; entered in force at the same date.

the existence of potential threats posed by contaminants in the Arctic region. The parties undertake cooperation in research, monitoring, assessment and other activities, including, *inter alia*, the pathways by which contaminants reach and are dispersed within the Arctic environment and the effect of contaminants upon human health and Arctic flora and fauna. American-Russian scientific cooperation can take place within the Arctic Monitoring and Assessment Program.

Canada-Russia. Canada and Russia signed an *Agreement on the cooperation in the Arctic and the North*,[62] which establishes the *Canada-Russia Mixed Commission on Cooperation in the Arctic and the North.*

Canada-USA. Canada and the USA also signed in 1988 an *Agreement on Arctic cooperation*[63] whose object is to facilitate navigation by their icebreakers in their respective Arctic waters; the parties affirm that "navigation and resource development in the Arctic must not adversely affect the unique environment of the region." In 1996, the USA did accept to pay $100 million to Canada concerning an *ex gratia* settlement of certain costs of environmental clean-up at four former U.S. military installations in Canada, more particularly for the 21 Dew Line sites[64].

Canada-USA-Mexico. Finally, under the side agreement to NAFTA, called the 1994 *North American Agreement on Environmental Cooperation*, Canada, Mexico and the USA agreed to elaborate recommendations for projects, which might cause significant transboundary effects. In 1997, the three States accepted to negotiate a transboundary environmental impact assessment agreement and negotiations were held in 1999 on that issue. The goal of the proposed treaty is to avoid environment-related border disputes in assuring that cross-border effects of projects be included in national environmental impact assessment and that bordering states and their citizens are able to participate in the assessment process.

4.2.2 Multilateral agreements—*AEPS* The Arctic Environmental Protection Strategy was adopted on June 14, 1991, in Rovaniemi, Finland,[65] by representatives of Canada, Denmark, Finland, Iceland, Norway, Sweden, the Union of Soviet Socialist Republics, and the United States of America. Its objectives are to protect Arctic ecosystems, eliminate pollution, promote the sustainable use of natural resources, including their use by local populations and indigenous people, and to accomodate the traditional and cultural needs of the indigenous people. It is based on five principles: a) sustainable development; b) enjoyment of present and future generations; c) respect for the health, social, economic, cultural needs and traditional knowledge of indigenous people; d) international cooperation; e) environmental impact assessment of proposed activities. The AEPS is comprises several programs: the Arctic Monitoring and Assessment Program (AMAP); the Program on Conservation of Arctic Flora and Fauna (CAFF); the Program for Protection of the Arctic Marine Environment (PAME); the Emergency Prevention, Preparedness and Response Program (EPPR); and, the Environmental Impact Assessment Group (EIA) under the Working Group for Sustainable Development and Utilisation (SDU).

By virtue of the AEPS, the Arctic Monitoring and Assessment Program (AMAP) has the mandate "to monitor the levels of anthropogenic pollutants and the assessment of their effects in relevant component parts of the Arctic environment." As mentioned earlier, in 1997 the AMAP published an important Report entitled *Arctic Pollution Issues: A State of the Arctic Environment Report*,.

A Working Group for the Conservation of Arctic Flora and Fauna (CAFF was established in Rovaniemi in 1991. Under the AEPS, the eight Arctic countries agreed to "co-operate for the conservation of Arctic flora and fauna, their diversity and their habitats." The Working Group initiated several projects; the first is on the implementation of the *Circumpolar Protected Areas Network Strategy and Action Plan* (CPAN), which led to the implementation of the *International Murre*[66]

[62] 1992 CTS 18.

[63] 1988 CTS 29.

[64] Exchange of Notes between the Government of Canada and the Government of the United States of America constituting an Agreement with respect to environmental issues, Canada Treaty Series 1996/35.

[65] In 1993, the same countries signed the *Nuuk Declaration on Environment and Development in the Arctic*; in 1996, they signed the *Inuvik Declaration on Environmental Protection and Sustainable development in the Arctic*, through which the Arctic Council was established.

[66] Species of seabirds, which inhabit coastal and offshore marine regions of all northern circumpolar countries.

Conservation Strategy and Action Plan and the *Circumpolar Eider Conservation Strategy an Action Plan.* The second relates to the development of an *Arctic Strategy for the Conservation of Biological Diversity in the Arctic Region*; its goals are, naturally, the conservation of Arctic biological diversity, but it also permits the participation of local and indigenous people in the development and implementation of policies and programs. The third is the *Circumpolar Seabird Working Group* (CSWG), which identifies seabirds species breeding in the Arctic and monitors their population trends.

The Protection of the Arctic Marine Environment (PAME) Working Group advocates for the protection of the Arctic marine environment from land- and sea-based activities, through a "Regional Program of Action for the Protection of the Arctic Marine Environment from Land-Based Activities" and on "Arctic Offshore Oil and Gas Guidelines."[67]" In its *Report to the Third Ministerial Conference on the protection of the Arctic environment,*[68] the Group proceeded to an interesting brief analysis of existing international instruments relating to land-based activities, ocean dumping, shipping activities, and offshore oil and gas activities. In 1997, PAME presented its *Arctic Offshore Oil and Gas Guideline* to the Alta Conference.

Finally, the AEPS created a special group that elaborated an *Arctic Guide for emergency prevention, preparedness and response (AEPR).*

The Arctic Council. The Arctic Council, established in Ottawa on September 19, 1996; has eight members: Canada, Finland, Iceland, Norway, the Russian Federation, Sweden, and the United States. Indigenous people are represented into the Council; the Inuit Circumpolar Conference, the Saami Council, and the Association of Indigenous Minorities in the Far North, Siberia, the Far East of the Russian Federation are Permanent Participants. The Council is "dedicated to the well-being of the inhabitants of the Arctic and the protection of the Arctic environment," and provides for the health of Arctic ecosystems, maintenance of biodiversity in the Arctic region, and conservation and sustainable use of natural resources."[69] Section 1 of the *Declaration* states that the Arctic Council is established as "a high level forum to: (a) provide a means for promoting cooperation, coordination, and interaction among the Arctic States, with the involvement of Arctic indigenous communities and other Arctic inhabitants on common arctic issues, particularly on sustainable development and environmental protection in the Arctic; (b) oversee and coordinate programs established under the AEPS on the Arctic Monitoring and Assessment Program (AMAP); conservation of Arctic Flora and Fauna (CAFF); Protection of the Arctic Marine Environment (PAME); and Emergency Preparedness and Response (EPPR)." In 1997, the Arctic Council assumed responsibility for overseeing and coordinating programs established under the AEPS. In 1998, the Council adopted the *Terms of Reference for a Sustainable Development Program.*

In view of the paramount importance of attaining ecological sustainability in the Arctic region, regional co-operation in the protection and preservation of the Arctic environment seems to be a real necessity. The creation of the Arctic Council can be viewed as a great achievement. Over time, it can develop a comprehensive vision of sustainable development in the entire Arctic region.

4.2.3 Protection of Wild fauna and flora

It has been noted that compared to temperate and tropical ecosystems, there are relatively few species of animals and plants in the North and for this reason, conservation is of the utmost importance. It is recognized that Arctic species, populations and their habitats are being threatened by human activities, which affect both the environment and cultural survival of indigenous people. According to CAFF, the total number of endangered species (birds, mammals and plants) of the Arctic identified by the Arctic countries exceeds 200. Reports from CAFF establish that many Arctic species of birds and mammals are endangered; the list includes marine mammals[70] (e.g., whales), carnivores (e.g., bears and wolves), birds[71] (e.g., falcons and eagles).

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[67] See section 2.3.1.3

[68] PAME Working Group on the Protection of the Arctic Marine Environment, Ministry of Environment, Norway, 1996.

[69] Arctic Council, Declaration on the establishment of the Arctic Council.

[70] Mammals listed at risk by more than one CAFF Country: Harbour Seal, Wolf, Fin Whale, Narwhal, Sei Whale, Blue Whale, Otter, Sperm Whale, Bowhead Whale, Walrus Blue Fox, Humpback Whale, Harbour Porpoise, Brown Bear, Wolverine, Polar Bear, Caribou Right Whale.

[71] Bird Species listed at risk by more than one CAFF Country: Kiitliz's Murrelet, Pintail, Harlequin Duck, Black Scoter, Caspian Tern, White-Tailed Eagle, Brant Goose, Golden

The loss of biological diversity is occurring as a result of many causes. The *Program for the Conservation of the Arctic flora and fauna* (CAFF) identifies some of the threats to Arctic biodiversity; the most widespread and serious threats are: mineral and petroleum exploration and development; oil spills; hydropower development; overgrazing; introduction of alien species and noise; road infrastructure; habitat fragmentation; motorized vehicles; tourism expansion; over-exploitation of species; fishery practices; ocean dumping; airborne contaminants; nuclear waste; and, climate change. CAFF established a Biological Diversity Task Force lead by Finland to develop a Cooperative Strategy for the Conservation of Biological Diversity in the Arctic Region. The other participants are: Greenland, Canada, the Inuit Circumpolar Conference, the Saami Council and the CAFF Secretariat.[72]

Polar bears. The *International agreement on conservation of polar bears and their habitat* was adopted in 1973 by the five polar bear States (Canada, Norway, the United States, and the USSR. With this convention, each State recognizes its responsibilities for the coordination of actions to protect polar bears. They accept to protect polar bear habitats, especially denning and feeding areas and migratory routes. Article I states that the taking of polar bears is prohibited except as provided in Article III, which authorizes the killing of polar bears for scientific or conservation purposes, or to prevent serious disturbance of the management of other living resources; local people using traditional methods in the exercise of their traditional rights may also kill polar bears, subject to the laws of each state. The agreement prohibits the export, import and sale of polar bears or any part or product thereof. The polar bear is considered a threatened species if international trade is not regulated; it was placed in Appendix II of the *Convention on international trade in endangered species of wild fauna and flora* in 1975, meaning that international trade is permitted only if authorized by the exporting State. In Canada, Alaska, and Greenland, natives may hunt polar bears;[73] by contrast, Norway and Russia do not authorize the killing of polar bears. Rothwell (1996:330) states that it is an anomaly for Canada to permit native residents to sell their polar bear permit to non-residents.

Caribou. The Porcupine caribou herd migrates continually across the international boundary between Alaska and Yukon and the Northwest Territories. For centuries, native peoples have harvested Porcupine caribou to meet their nutritional, cultural and other needs. An Agreement[74] between the USA and Canada was concluded in 1987 to conserve the herd and its habitats through bilateral cooperation measures. One of the most important principle of the *Convention* is that both parties must ensure that the Porcupine caribou herd, its habitat, and the interests of native users are given "effective consideration in evaluating proposed activities within the range of the herd." An advisory council—the International Porcupine Caribou Board—was established to make recommendations to the parties. The commercial sale of meat from the Porcupine caribou herd is prohibited.

Migratory birds

Canada/USA. In order to insure the protection of certain birds species[75] which migrate between Canada and the United States, a Convention[76] for the Protection of Migratory Birds between Canada and the USA was signed in 1916. The convention sets certain dates for closed seasons on migratory game birds, and prohibits the killing of insectivorous birds, except if they are harmful to agriculture. It is generally prohibited to kill non-game birds, except for Eskimos and Indians.[77] In

Eagle, Gyrfalcon, Osprey, Greater Scaup, Snowy Owl, Ross' Gull, Shore Lark, Lesser White Fronted, Black-Headed Gull, Eskimo Curlew, Goose, Great Gray Owl, Bar Tailed Godwit, Peregrine Falcon, Ivory Gull.

[72] The *Strategy* is a framework for the CAFF Program. The goals contained in this Strategy are provided as guidelines for countries. The mains areas for action are: identification of Arctic biological biodiversity; identification of threats; environmental impact assessment; habitat conservation and restoration; conservation outside protected areas; sustainable use of biological resources.

[73] According to one author, Alaska natives kill about 100 bears a year for subsistence, Canadian Inuit 500. See: Eliot, J. 1998. *Polar Bears. Stalkers of the high Arctic. National Geographic* 1:52.

[74] *Agreement between the Government of Canada and the Government of the United States of America on the conservation of the Porcupine caribou herd*, Canada Treat Series, 1987, no 31.

[75] Migratory game birds like wild ducks, geese, cranes and swans, migratory insectivorous birds and other birds like murres, guillemots, herons, and terns.

[76] TS 628. Consolidated treaty series no 221, p.408.

[77] Eskimos and Indians "may take at any season auks, auklets, guillemots, murres and puffins, and their eggs, for food and

1979, the two countries signed an amendment to the treaty allowing subsistence hunting of waterfowl outside of the normal hunting seasons, but the American Senate did not ratify the agreement. On December 14, 1995, the same parties signed another Protocol to the 1916 *Convention*, by which Aboriginal people from Alaska and Canada are authorized to hunt migratory birds as they had always done before 1916.

USA/Russia. The *Convention*[78] *between the United States of America and the Union of Soviet Socialist Republics concerning the conservation of migratory birds and their environment*, was signed in Moscow on November 19, 1976. It provides for the protection of bird species that migrate between the United States and the Soviet Union, and encourages actions to identify and protect important habitats against pollution and other environmental degradation.

4.2.4 Marine environment

Pollution issues. The Working Group on the Protection of the Arctic Marine environment (PAME) published an important Report (PAME 1996). PAME has a mandate, within the Arctic Environmental Protection Strategy to assess the need for further action at both national and international levels to prevent pollution of the arctic marine environment. In its *Report to the Third Ministerial Conference on the Protection of the Arctic Environment* submitted in March 1996 in Inuvik, PAME summarized its findings in the following way:

1-Land-based activities may be responsible for as much as 80% of different pollutants entering the Arctic marine environment (PAME 1996:29).
2-Limited dumping of those wastes listed on Annex II of LC72 has taken place in the last ten years (PAME 1996:87).
3-There is insufficient information available on present and future shipping activities in the Arctic and their effects on the marine environment. Nevertheless, increases in the ship traffic will increase the risk of pollution (PAME 1996:117).
4-The offshore petroleum activities in the Arctic are currently low but are expected to increase in the future. This may lead to an increased amount of discharges/emissions of oil in the Arctic. (PAME 1996:135)
5-PAME considers that existing instruments provide an adequate basis for the protection of the Arctic marine environmen (PAME 1996:14)

Two conventions are now addressing the specific problems of Arctic pollution. The first is the 1982 *United Nations Convention on the law of the sea*. The second is the 1992 *Convention for the Protection of the Marine Environment of the North-East Atlantic* (Ospar 1992), which covers part of the Arctic Ocean. Guidelines for offshore activities were adopted by the Arctic Council in 1997 and a special Program for the protection of the Arctic ocean from land-based activities was established in 1998.

UNCLOS, Article 234. Article 234 of the *United Nations Convention on the law of the sea* (UNCLOS) provides special protection for ice-covered areas, and authorizes each Arctic State to adopt and enforce its laws for the prevention and control of pollution from vessels within the limits of its exclusive economic zone. This article appears as an exception to the general regime established under UNCLOS. Indeed, under the general system, it is only when there are clear grounds for believing that a vessel navigating in the exclusive economic zone has committed a violation of applicable international rules and standards for the control of pollution resulting in a discharge causing major damage or threat of major damage to the coastline or related interests of the coastal State, this State may institute proceedings, including detention of the vessel.[79]

As Rothwell (1996) notes, article 234 "does provide Arctic States with stronger powers to implement more extensive jurisdiction over foreign-flagged vessels."

The 1992 *Convention for the Protection of the Marine Environment of the North-East Atlantic* (Ospar Convention). The *Ospar Convention*, ratified by all of the former Parties to the Oslo and Paris Conventions[80] has been in force since March 25, 1998.[81] Five Arctic States (Iceland, Norway, Denmark, Finland, and Sweden) are now bound by this *Convention*, which is open for signature to other States. The area covered by the Convention is only a part of the Arctic Ocean—from the east coast of Greenland to the continental North Sea coast, and from the North Pole to the Strait of

their skins for clothing, but the birds and eggs so taken shall not be sold or offered for sale." (Section 2, par.3)

[78] T.I.A.S. 9073. The *Convention* was ratified on October 13, 1978.

[79] UNCLOS, art. 220

[80] Belgium, Denmark, the Commission of the European Communities, Finland, France, Germany, Iceland, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom of Great Britain and Northern Ireland and Luxembourg and Switzerland.

[81] The first Ministerial Meeting of the OSPAR Commission was held in Sintra, Portugal on 22 and 23July 1998.

Gibraltar—and includes internal waters, territorial seas, exclusive economic zones, and high seas. It replaces the 1972 *Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft* (the *Oslo Convention*) and the 1974 *Convention for the Prevention of Marine Pollution from Land-Based Sources* (the *Paris Convention*). Parties to the agreement must take all possible steps to prevent and eliminate pollution in these maritime areas. The *Convention* contains a complete set of rules governing all forms of pollution: land-based sources, dumping or incineration, offshore sources, and any other source.

At regular intervals, parties to the convention must report to the Commission, comprising representatives of each State, on legal measures taken by them for the implementation of the *Convention*. It is important to note that contracting parties accept two fundamental principles in their action, the first is the 'precautionary principle,' by virtue of which preventive measures are to be taken when there are reasonable grounds for concern; the second is the 'polluter pays principle by virtue of which the costs of corrective measures are to be borne by the polluter.

Arctic offshore oil & gas guidelines. Guidelines for offshore petroleum activities in the Arctic were adopted by the Arctic States in 1997 in Alta, Norway, but they are non-binding in legal terms. Section 1.2 states that the guidelines should be used "to secure common policy and practices" and are "intended to encourage the highest standards currently available;" it further provinces that they "are intended to define a set of recommended practices for consideration by those responsible for regulation of offshore oil and gas activities." Arctic offshore oil and gas activities must be based on the three fundamental principles: the precautionary approach, the polluter pays principle; and, sustainable development. The guidelines impose an environmental impact assessment process and stipulate that living resources, cultural values, and other human activities must be respected in planning and executing offshore operations.

The Regional Program of Action for the Protection of the Arctic Marine Environment from land-based activities. This program was adopted on September 1998 by the Arctic Council in the Iqaluit Declaration. It is based on the idea that Arctic States must work together to protect the marine environment from land-based activities. The program recommends that assessment of these activities should consider the severity of the problem in relation to five factors, the first being food security, and the second public health.[82]

Nuclear wastes. All the Arctic countries are parties to the *Convention on the prevention of marine pollution by dumping of waste and other matters,* which disallows dumping into the seas such dangerous matter as high level radioactive waste, but until 1994 it allowed the dumping low level radioactive waste. According to the PAME Report, high level radioactive waste was dumped into the Kara Sea by the former USSR,[83] as for low level radioactive waste, it seems that Russia does not have adequate on-land treatment facilities to accept the 1974 ban as a matter of law[84] but in fact[85] it does respect the ban as a 'self-imposed moratorium.'

Polar Code of navigation. The International Maritime Organization has been working since 1998 on an *International Polar Code of Safety for Ships in Polar Waters.* The draft Code was submitted by Canada, on behalf of an international Group, contains sections on construction requirements, equipment standards, and operational requirements for ships.[86]

3.3.5 Protection of marine resources

Many international agreements have been adopted in the past with regard to particular marine resources, like seals and whales.

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[82] The three other factors are: marine resources, ecosystem health and socio-economic benefits. Arctic Council, Regional Program of Action for the Protection of the Arctic Marine Environment from land-based activities, Canada 1999, p.3.

[83] Working Group on the Protection of the Arctic Marine Environment (PAME). 1996, p. 90." The wastes dumped included seventeen nuclear reactors, six of which contained spent nuclear fuel, and the icebreaker Lenin's shield assemble, (sic) with residual spent nuclear fuel. The dumping sites were in Abrosomov inlet, Tsivolki Inlet, Stepovoy Inlet and the Novaya Zemlya Depression".

[84] Ibidem, p.99.

[85] Ibidem, p.90.

[86] [1998] 34 Polar Record, p.274.

Seals. A Report[87] published in 1997 by the Inuit Circumpolar Conference, acknowledges the fact that for "thousands of years, Inuit and other Indigenous peoples depended upon ringed, bearded, harp, fur, and several other species of seal to fulfill their nutritional, economic, social, cultural, spiritual and other needs.[88] The same Report says that today, "the market for seals is virtually non-existent" and consequently, that the collapse of this market resulted in a decline in seal hunting.

The 1911/ 1957 *Convention Respecting Measures for the Preservation and Protection of Fur Seals in the North Pacific Ocean*.. A first Convention[89] was concluded in 1911 between Great Britain (Canada), Japan, Russia and the USA for the preservation of fur seals in the North Pacific Ocean; it was in operation until 1941 (Rothwell 1996). The same Parties signed a similar Convention[90] in 1957 and established the North Pacific Fur Seal Commission. The objective of the convention is "to take effective measures towards achieving the maximum sustainable productivity of the fur seal resources. The Parties agreed to conduct scientific research programs and to cooperate in order to determine the effective measures, which are necessary to get the maximum sustainable productivity of fur seal resources. There is a general prohibition for each Party to hunt fur seals at sea unless it obeys the rules concerning scientific research and quotas. The Convention does not apply to Indians, Ainos Aleuts or Eskimos who carry on pelagic sealing in canoes propelled entirely by oars, paddles or sails. According to Rothwell (1996:326), the USA decided not to reconduce the Convention and the international regime collapsed in 1984.

Whales. At the last meeting of the International Whaling Commission in May 1998, IWC upheld its 1982 decision which had set catch limits for commercial whaling at zero but renewed the catch limits for stocks subject to aboriginal subsistence whaling in the Bering-Chukchi-Beaufort seas, the Eastern North Pacific and East and West Greenland[91].

The North Atlantic Marine Mammal Commission. The *Agreement on Cooperation in Research, Conservation and management of Marine Mammals in the North Atlantic* (NAMMCO) was signed in Nuuk, Greenland on April 9, 1992 by Norway, Iceland, Greenland and the Faroe Islands. It establishes the North Atlantic Marine Mammal Commission as a new international organization with a mandate to contribute, through regional consultation and cooperation, to the conservation and rational management of marine mammals in the North Atlantic. The agreement covers all species of cetaceans such as whales and dolphins, and other mammals like seals and walruses. With respect to stocks within their respective mandates, management committees propose, unanimously, measures for conservation and management, to their member States. In 1998, international observers from NAMMCO began monitoring all forms of marine mammal hunting activities in member countries.

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[87] *The Arctic Sealing Industry. A Retrospective analysis of its collapse and options for sustainable Development*, Part One: Retrospective analysis, 1997.

[88] Ibidem, p.3.

[89] 214 USA Consolidated Treaty Series 80.

[90] Interim *Convention between the United States of America, Canada, Japan and the Union of Soviet Socialist Republics on the conservation of North Pacific Fur Seals.* Signed in Washington, on February 9, 1957. 314 UNTS 150.

[91] Sec. Gen. Report 1998 A53/456, parag. 293. According to the Convention Schedule, catch limits for Aboriginal subsistence whaling are as follows: the taking of bowhead whales from the Bering-Chukchi-Beaufort Seas stock by aborigines is allowed, but only when the meat and products of such whales are to be used exclusively for local consumption by the natives and provided that for the years 1998, 1999, 2000, 2001 and 2002, the number of bowhead whales landed shall not exceed 280; for each of these years the number of bowhead whales struck shall not exceed 67. The taking by aborigines of minke whales from the West Greenland and Central stocks and fin whales from the West Greenland stock is allowed only when the meat and products are to be used exclusively for local consumption. The number of minke whales struck from the West Greenland stock shall not exceed 175 in each of the years 1998, 1999, 2000, 2001 and 2002. The number of minke whales from the Central stock taken must not exceed 12 in each of the years 1998, 1999, 2000, 2001 and 2002. The number of fin whales from the West Greenland stock must not exceed 19.

Cetaceans (ASCOBANS 1991).
The original parties to the *Agreement on the Conservation of small cetaceans of the Baltic and North Seas Agreement*[92] are Belgium, Denmark, Germany, the Netherlands, Poland, Sweden and the United Kingdom. Adopted in 1991, this Agreement was put into force on March 29, 1994. By this *Convention*, the parties undertake to cooperate in order to maintain a favourable conservation status for small cetaceans such as harbour porpoises; particularly, they must apply the conservation plan prescribed in the convention within the limits of their jurisdiction.

Salmon
The *North Atlantic Salmon Treaty* (NASCO). *The Convention for Conservation of Salmon in the North Atlantic*[93] was signed in Reykjavik on March 2, 1982. It is designed to control and manage the high sea interception of salmon before they return to their rivers of origin. The *Convention* establishes a ban on salmon fishing beyond 12 miles offshore, except in the case of West Greenland and the Faroe Islands, where fishing may occur within 40 and 200 miles offshore, respectively. The Parties established an international organization for the conservation and protection of Atlantic salmon; the organization consists of a council and three regional commissions, which may propose regulations on salmon interceptions. In June 1996, the International Council for Exploration of the Sea voted in favour of a zero catch limit on the commercial harvest of salmon in Labrador and off Greenland but these two countries decided to maintain fisheries.

The *Pacific Salmon Treaty*. Canada and the United States signed this important treaty[94] in 1985. The treaty covers five species[95] of Pacific salmon and applies to fisheries in South East Alaska, British Columbia, Washington, and Oregon. Both must cooperate in the management of the resource and conduct their fisheries so as to prevent overfishing, to provide for optimum production, and receive benefits equivalent to the production of salmon originating in their respective waters. This means that both countries should take fish in proportion to the fish its rivers produce. They must agree on fishing arrangements to address conservation problems and place limits on fisheries in each country. The Pacific Salmon Commission has the power to make recommendations to or advise the parties on any matter relating to the *Treaty*; it has the specific power to recommend fishery regimes to the Parties. The agreement worked for the first eight years but since 1992, it has seen challenges, with both sides saying that the other takes too many 'foreign' salmon.

The *North Pacific Anadromous Fish Commission* (NPAFC). Recognizing that anadromous stocks in the North Pacific Ocean originate primarily in the waters of Canada, Japan, the Russian Federation and the United States of America, these four States in 1992 signed the *Convention for the Conservation of Anadromous Fish Stocks in the North Pacific Ocean,* an agreement that ended the controversial practice of anadromous fishing in the high seas. Except for scientific purposes, directed fishing for anadromous fish is prohibited in the convention area, i.e., all waters of the North Pacific Ocean beyond 200 nautical miles and north of 33 degrees North Latitude. The objective of the Commission is to promote the conservation of anadromous stocks in the convention area. It coordinates the collection, exchange and analysis of scientific data and organizes the high seas fishery enforcement activities of its member nations.

4.2.6 Barriers to trade
Following the seal movement protest in the 1960s and 1970s, the European Community banned the import of seal pelts in 1983 and the boycott is still operative; the ban had devastating effects on the livelihood of thousands of Inuit, especially in Greenland and Canada. A *Task Force on Sustainable development and Utilization* was

[92] The 'area of the agreement' refers to "the marine environment of the Baltic and North Seas, as delimited to the north-east by the shores of the Gulfs of Bothnia and Finland; to the south-west by latitude 48° 30' N and longitude 5° W; to the north-west by longitude 5° W and a line drawn through the following points: latitude 60° N / longitude 5° W, latitude 61° N / longitude 4° W, and latitude 62° N / longitude 3° W; to the north by latitude 62° N; and including the Kattegat and the Sound and Belt passages, but excluding the waters between Cape Wrath and St Anthony Head."

[93] T.I.A.S. 10789. Entry in force October 1, 1983. Parties: Canada, Denmark, European Community (including Finland and Sweden, which were NASCO members before they joined the EU), Iceland, Norway, Russia and the United States.

[94] Treaty between Canada and the United States for the conservation, rational management, and optimum production of Pacific Salmon.(March 18, 1985)

[95] Sockeye, chinook, coho, pink , chum and steelhead.

established in 1993 on the basis of the Arctic Environmental Protection Strategy in order to study the problem; a first Report entitled *The Arctic Sealing Industry* was published in 1997 by the Inuit Circumpolar Conference. According to the Report,[96] Canada "failed to address the real concern of the European Parliament: the public outcry against 'the massacre of baby seals'." In fact, it was impotent in fighting against radical environmentalists and animal rights groups' demands.[97] In 1991, Europe imposed another ban on wild fur imports from animals caught in leg-hole traps but this ban has been removed recently.

The USA has a unique way of enforcing international agreements. If the Secretary of Commerce decides that "nationals of a foreign country are conducting fishing operations in a manner or under circumstances which diminish the effectiveness of an international fishery program," the American President may instruct the Secretary of Treasury to ban imports of fish products from that country. Japan and Norway were the first victims of these laws, although sanctions were never imposed by the President.

4.2.7 Maritime boundaries

To a certain extent, food security in the Arctic could be affected by the consequences of maritime boundary disputes. Many disputes were resolved in recent years, for example, that between Norway and Iceland about Jan Mayen; between Denmark and Norway with respect to the boundary between Greenland and Jan Mayen;[98] and, between Canada and Denmark about Greenland.[99] But there are many maritime boundary disputes in the Arctic that have not yet been resolved; these concern Canada and the USA in the Beaufort sea; Norway and Russia in the Barents sea; and, Norway on the one hand and Russia, USA and UK on the other over Svalbard maritime boundaries (Rothwell 1996:179)

[96] The Arctic sealing industry, 1997, p.53.

[97] Aqqaluk Lynge, "Remarks to the United Commission for Sustainable Development", New York, 15 April 1997.

[98] Case concerning maritime delimitation in the area between Greenland and Jan Mayen (Denmark/Norway) 1993 ICJ Reports 38.

[99] *Agreement between the Government of Canada and the Government of the Kingdom of Denmark relating to the delimitation of the continental shelf between Greenlandand Canada*, 1974 CTS 9.

5. CONCLUSION

5.1-As a general statement, it is submitted that circumpolar problems, as opposed to global problems, should be preferred in analyzing international legal problems. If global problems must be treated, a choice has to be made between them and it is suggested that persistent organic pollutants and heavy metals should be granted the highest priority.

5.2-To the extent that marine mammals are considered "the most important sources of food" for most Inuit (ICC 1995:12), our research project should be oriented towards them. At a conference in St. John organized by NAMMCO in 1997, participants called for elimination of barriers to trade in seal products, and that circumpolar whaling is still on the agenda of Arctic organizations.

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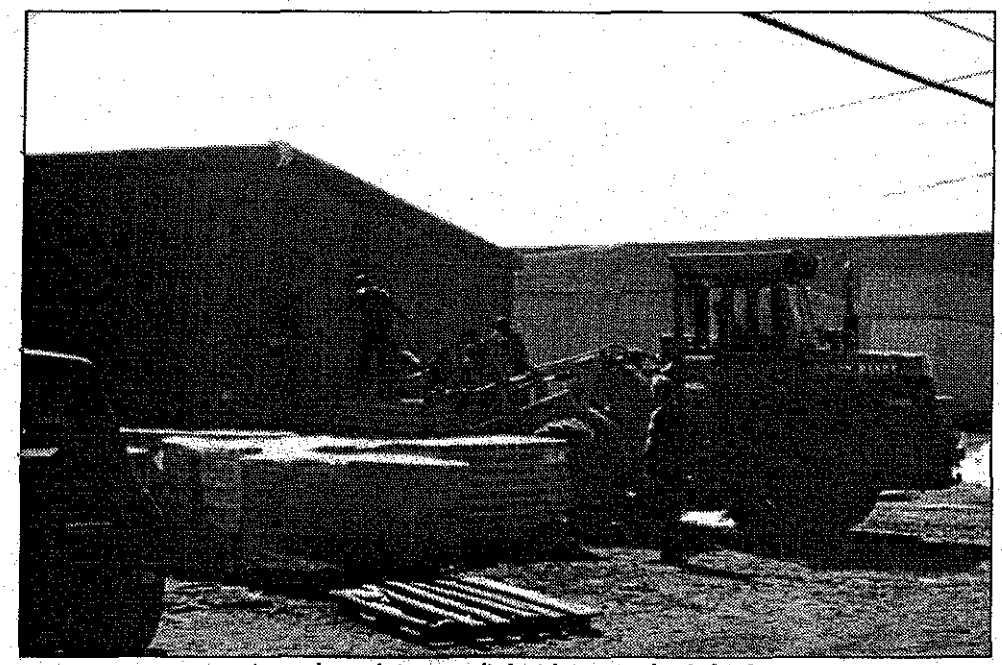

A warehouse being supplied with imported soft drinks.