LAND-BASED MARINE POLLUTION IN ARCTIC

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List of Abbreviations

AEPS	Arctic Environmental Protection Strategy.
LOSC	United Nation Conventions on Law of the Sea 1982
POPs	Persistent Organic Pollutants
UNEP	United Nations Environment Program
RPA	The Arctic Council Regional Programed of Action for the Protection of the Arctic Marine Environment from Land-based Activities
MARPOL	International Convention on the Prevention of Pollution by ships
ACAP	Arctic Contaminants Action Program
IAEA	International Atomic Energy
NRPA	Norwegian Radiation Protection Agency
AMAP	Arctic Monitoring and Assessment Programme
CIL	customary international law
ICJ	International Court of Justice
PAME	Protection of the Arctic Marine Environment
ILO	International Labor Organization
ITLOS	International Tribunal on the Law of the Sea
EEZ	Exclusive Economic Zone
RSP	Regional Seas Agreements
OSPAR	Convention for the protection of Marine environment of the North-East Atlantic
UNECE	United Nations Economic Commission for Europe
LBS	Land-Based Sources and activities

Chapter 1

1.1 Introduction

The earth is probably the only place in the universe that can support human life. Human being is dependent on the earth`s environment and its natural resources. Massive industrialization is causing the depletion of natural resources and pollution of air and oceans. Relevant laws and regulations are important to solve those problems. 70 per cent of world`s oxygen and 80 per cent of its plants and animal life comes from oceans. Our planet is more of water than land and oceans can be called lung of the earth.

Land-based pollution represents the single most important cause of marine pollution. The threat of land-based pollution to the marine environment is a serious one since it mainly affects coastal waters, which are sites of high biological productivity. The occurrence of high concentrations of pollutants in the Arctic environment has been a concern for many years.. Regional and international actions over the past two decades attempting to manage pollutants in the Arctic environment from land- based sources have produced recommendations that focus primarily on increasing cooperation in research and monitoring activities, not only among the Arctic governments themselves, but also including the interests and resources of non-polar countries.

Considering that States are usually unwilling to take strong measures to regulate land-based activities, legal techniques to limit the margin of discretion of States is at the heart in the protection of the marine environment from land-based pollution. In this respect, it is important to note that legal techniques and approaches to enhance the regulation of land-based marine pollution are developing particularly in regional conventions. It would seem that those regional treaties might provide a useful insight to consider legal techniques and institutions reconciling the protection of the marine environment from land-based sources and the economic development. Thus, the second question to be examined in this study is whether and to what extent those approaches enshrined in regional treaties may serve for enhancing the regulation of marine pollution from land-based activities in international law.

The Arctic lands are home to a growing population of nearly four million people. According to UNEP report one/third of these are people from indigenous groups, who typically live in small communities scattered along the Arctic coast. Those people shares common cultural

heritage through out the boundaries and there lives are dependent on wildlife harvesting.[1]The Arctic Ocean, positioned strategically between two landmasses, offers access to two other world oceans and it`s a semi-enclosed ocean with abundant resources.[2] The concern about impacts of land-based pollution is equal or in some cases, greater in the North than in countries to the South.[3]

Land-based pollution can be defined: -

Marine pollution due to discharges by costal establishments or coming from any other sources situated on land or artificial structures, including pollution transported by rivers into the sea.
In most of reports estimated that 70 percent of marine pollution comes directly from land-based sources. Pollution of the marine environment from land-based sources is the principal sources of ocean pollution, which arises from two general sources.[4]

1.Substances and energy entering the marine environment by run-off from land, rivers, pipelines and other outfall structures, which accounts for some 44 percent of all marine pollution.[5]

2.The atmosphere, generated principally from land-based activities but also from ships and aircraft, which accounts for some 33 percent of marine pollution.[6]

The occurrence of high concentrations of pollution caused by humans in the Arctic environment has been a concern for many years. Regional and international actions over the past two decades attempting to manage pollutants in the arctic environment from land-based sources have produced recommendations that focus primarily on increasing cooperation in research and monitoring activities. Control and prevention of marine pollution is a prerequisite for the conservation of marine species and ecosystem.[7]

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[1] The Arctic Institute of North America, `Land-Based pollution in the Arctic Ocean`, Vol.61, Suppl.1 (2008) P.111-112
[2] Id
[3] Id
[4] Duan Hassan. `Protecting the Marine Environment from Land-Based Sources of Pollution`, *Towards Effective International Cooperation,* 2006,p.2
[5] Id
[6] Id
[7] Gouilloud, M.R., `prevention and Control of Marine Pollution`, in Johnson, D.M (ed), *The Environmental Law of the sea,* Erich Schimidt Verlag, 1981,p.193

Different sources indicated that land based source of marine pollution is the dominant threat. Considering that states are usually unwilling to take strong measures to regulate land-based activities, legal techniques to limit the margin of discretions of States is at the higher level in the protection of the marine environment from land-based pollution.

The task of protecting the marine environment from land-based pollution is a burning issue of international concern. Until 20th centaury there was no legal mechanism to combat the problem. The only legal polices were concerned with the conservation of marine birds and fisheries. [8] Without emphasis on Land-based marine pollution convention on oil pollution from ships was adopted in 1954.[9] 1960s Paris Convention relating to land-based sources and Helsinki Convention, adopted provisions about Land-based marine pollutions.

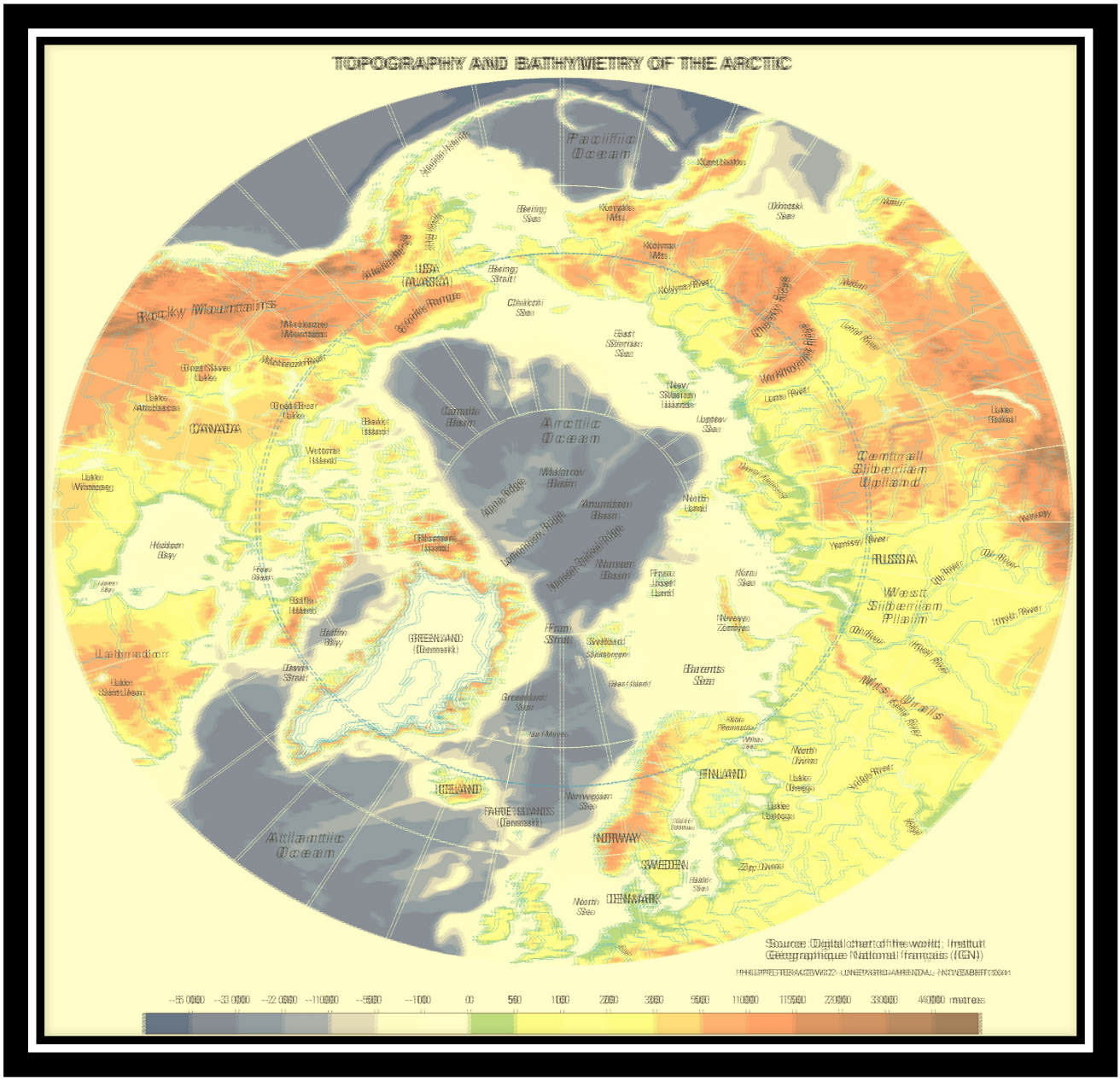
United Nations Convention on Law of the sea 1982 was an important improvement on previous laws.[10] LOSC addresses and regulate maritime environmental issues with it`s limitations. By addressing those issues, the LOSC has become a fundamental instrument of maritime law.[11]

This paper demonstrates the complexity and breadth of the issues of land-based marine pollutions in Arctic, reviews the progress towards the management of risks and impacts associated with these pollutions, and comments on the proposed path towards rectification and appropriate management of these concerns.

Accordingly, the present paper will contain four subdivisions. Following the introduction in Chapter one, Chapter two will examine Sources and Effects of Land Based Maritime Pollution in the Arctic, Chapter three will then analyze the development of approaches, legal techniques to this issue at the regional level and global legal framework concerning the regulation of land-based pollution. Special emphasis will be on the identification of harmful substances, precautionary approach, regulatory measures, and the international control

[8] Cyrille de Klemn, Living Resources of the Oceans´, in Johnson, D.M(ed), P.92-93.
[9] Duan Hassan. `Protecting the Marine Environment from Land-Based Sources of Pollution`, *Towards Effective International Cooperation,* 2006,p.3
[10] Kidt, J.W., *Marine Pollution and The Law of the Sea,* Williams Hein and Co Inc, Buffalo, 1986,p.708.
[11] Duan Hassan. Supra note. 4

ensuring the implementation of relevant rules. Finally, general conclusions and recommendations will be added in Chapter four.



1.2 Environmental protection of the Arctic – a short history

Concerns about contaminants in the Arctic date back at least 30 years, with an increasing and broadening awareness since the early 1970s. In the spring of 1989, Finland proposed a conference on the protection of the Arctic environment. The governments of the other circumpolar countries favorably received the idea: Canada, Denmark/Greenland, Iceland, Norway, Sweden, the Soviet Union, and the United States. The first preparatory meetings

were held in Rovaniemi, Finland, in September 1989, which started the 'Rovaniemi process'.

One idea agreed upon early was to produce a series of reports concerning the potential pollutants in different parts of the Arctic environment and its ecosystems. These initial 'State of the Arctic Environment' reports were presented at the First Arctic Ministerial Conference in Rovaniemi, Finland in June 1991. The ministerial conference was a breakthrough in the development of international cooperation for the protection of the Arctic, and led to the adoption of the Arctic Environmental Protection Strategy (AEPS).

The objectives of the AEPS, as adopted in the Rovaniemi Declaration, are as follows:

- To protect the Arctic ecosystems, including humans;
- To provide for the protection, enhancement and restoration of environmental quality and sustainable utilization of natural resources, including their use by local populations and indigenous peoples in the Arctic;
- To recognize and, to the extent possible, seek to accommodate the traditional and cultural needs, values and practices of indigenous peoples as determined by themselves, related to the protection of the Arctic environment;
- To review regularly the state of the Arctic environment;
- To identify, reduce and, as a final goal, eliminate pollution.

Chapter 2

Sources and Effects of Land-Based Maritime Pollution In The Arctic.

Land-based sources of maritime pollution have become the major contributor of pollution in the Arctic maritime environment. Higher level of consequences can be demonstrated in a number of areas including public health, food resources, marine species integrity and health and survival.

The objective of this chapter is to provide the reader an understanding of the sources and effects of land-based maritime pollution in arctic with a view to demonstrating the need for effective solutions.

The word source originally refers to the point or place where a stream or a river begins.[12]As far as pollution is concerned sources can refer to the places from which harmful substances that cause pollution are generated and sometimes to human activities from which harmful substances are introduced to environment.[13]

Globally, it is estimated that about 10 billion tons of ballast water are taken on board ships and dumped each year. [14]The water taken on board for stabilizing a vessel may contain dormant stages of microscopic toxic aquatic plants, such as dinoflagellates, which may cause harmful algal blooms after their release. Pathogens such as the cholera bacteria have been transported with ballast water.[15] Many varieties of fish, plants, and other animals have all been found in ballast water. Higher rates of species transfer have been attributed to:

- Increases in ship numbers;
- Increases in the amount of ballast carried per ship;
- Increases in the amount of water being transported; and
- Increases in ship speeds, with shorter voyage times

[12] Gove, P., *Websters Third New International Dictionary,* Springfield, Mass, G&C Merriam Company, 1993.
[13] Meng Quing-nan, Land-based Marine Pollution: International Law and Development, Graham and Trotman: London, 1987,p.18
[14]https://www.thegef.org/gef/sites/thegef.org/files/publication/LBPS%20SYN%20Final.pdf
[15] Id

And higher survival rates of alien species transferred in the ballast water tanks.

All these factors provide a greater opportunity for introduction of non-indigenous organisms in new locations, leading to disastrous consequences for regional ecosystems that contain commercial fish or crustacean stocks or rare and endangered species. Projects considered under sea-based sources of pollution focus on response to threats posed by invasive marine species, technological options for management, and international regulations for prevention of marine pollution in projects concerned with ballast water pollution, invasive alien species etc.

The Arctic marine environments are being polluted from land-based sources, vessel-based sources, waste dumping at sea and offshore oil and mineral exploitation activities. However, several studies on sources of pollutants show the major contributory factor to marine pollution is from land-based sources.

Although the Arctic Ocean has remained relatively clean in relation to other oceans and marginal seas, there is no room for complacency. Combinations of physical and biological mechanisms can focus particular contaminants in certain geographical locations and/or species. Furthermore, geographically localized elevations in contaminant levels in the marine or estuary environment can be attributed to pollution sources within the Arctic basin and coastal zone.

According to Arctic Council Regional Programmed land-based pollutants within the Arctic have now become apparent:

1) The Polar Regions are extremely sensitive to the global rise in greenhouse gas emissions. Temperature rise affects ice cover, ocean processes, permafrost, and the population and distribution of species. Habitats can be altered or lost, and cultures changed by the disappearance of traditional foods.

2) Increasing resource industries and shipping activities in the Arctic Region are leading to coastal infrastructure development and demographic changes.

Land-based sources of pollution located both within and outside the Arctic, represent the major sources of pollutants to the Arctic marine environment. There is a need for integrated environmental management approaches (e.g. ecosystem-based management and integrated coastal area management) to address land-based sources of pollution at international, regional

and national levels, harmonized as appropriate with river basin and offshore management, and land-use planning.[16]

Land-based pollutants are largely the consequence of human activities on land, and along the coast. In relation to land-based marine pollution, increased impact of human activity is related to the increasing degree of urbanization and industrialization along costal areas and their adjacent watershed.[17]

The Arctic is polluted because the world in which we live is polluted. What is disturbing is that the "arctic wastes" of legend are now taking on a new meaning; remoteness and the absence of indigenous pollution sources no longer guarantee the well-being of northern communities and the viability of wildlife populations.[18]

In many respects, the Arctic serves as a benchmark for global pollution. The spillover of industrial contaminants from other regions via air, ocean, and river currents tells us a great deal about the overall health of the planet. And although new, often challenging, questions have been posed, the mere fact of pollution in the Arctic has sounded the alarm and helped rouse policy makers to the need for concerted action.

There are no easy answers to arctic pollution. The bio accumulative effect associated with repeated exposure to toxic substances counters the natural defenses of most organisms and means potentially dangerous levels of toxins can span generations. And while exposure to toxic pollutants is rarely fatal in humans, the effects-both direct and indirect-can be debilitating.

In most Arctic regions, current levels of pollution are low-considerably lower than in most urban and industrialized areas in the mid-latitudes- but still cause for concern because:

- Contamination of snow, waters, and organisms with "imported" pollutants is a phenomenon of the past few decades and appears to be increasing;

- Arctic ecosystems show indications of being much more susceptible to biological

[16] http://www.gpa.unep.org/documents/ecosystem-based_management_english.pdf

[17] Cote, R.P., `Marine Environmental Management: Status and Prospects`, *Marine pollution Bulletin, 1992:19*

[18] http://www.carc.org/pubs/v18no3/1.htm

damage at low levels of pollutants than higher-energy ecosystems in temperate latitudes; and

- Many arctic organisms, adapted to storing biological energy, become accumulators and concentrators of organic pollutants and toxic metals, so that animals at the top of the food chain, including humans who eat local foods, may carry pollutant concentrations much higher than levels in the ambient environment.

It is indeed a sad irony that the effects of non-indigenous pollution threaten the traditional, land-based economy of Arctic aboriginal populations, based on an abiding respect for natural ecosystems, most by the effects of non-indigenous pollution.

But while pollution is pollution no matter where it exists, the Arctic does present a potentially more serious situation. Detection, monitoring, and cleanup are difficult due to climatic conditions, remoteness, and the shifting interplay between land and sea-ice. Whereas solar radiation generally speeds the breakdown of contaminants, the reduced level of sunlight in the Arctic lengthens the degradation process and increases the likelihood that toxic substances will find their way into the food chain.

The effects of pollution from distant sources are in some cases clearly discernible in the Arctic, arctic regions serve as important indicators of environmental changes in the planet as a whole-and of the need for international action to control further deterioration.

The most polluted areas of Arctic at present are the highly industrialized Kola Peninsula and White Sea regions of northwestern Russia, and the large metallurgical and wood processing complexes of north-central Siberia. Each of these areas contributes to circumpolar pollution; the prevailing winds carry airborne pollutants over the central Arctic Basin, and the rivers deliver their contaminants to the Arctic Ocean.[19]

Other potential arctic sources of pollution are the areas of present or potential hydrocarbon production and transport in the arctic Soviet Union, arctic Canada and Alaska, and the adjacent seas.[20] The possibility of damage to sensitive arctic marine ecosystems by routine or accidental oil spills or disposal of radioactive waste is a serious concern for indigenous people

[19] http://www.carc.org/pubs/v18no3/1.htm
[20] Id

and others, who make use of, or value, the Arctic's marine and aquatic resources.

The accumulation of toxic substances in the arctic terrestrial, aquatic, and marine ecosystems represents a potentially serious threat to the regional environment. Toxic compounds, particularly organochlorines and some heavy metals, have been found in potentially worrying amounts in snow, waters, and organisms in arctic North America, Greenland, and Svalbard. The organochlorines (e.g., dioxins, furans, PCBs) accumulate in fatty tissue or bone marrow; and because arctic animals consume, and develop, considerable fatty tissue in order to conserve heat, and depend on reserves of marrow during periods of inactivity or hibernation, some remarkably high concentrations of toxins can result through short and simple food chains.[21]

The human physiological response to the accumulation of toxic materials in the arctic environment is a cause for concern. [22]Northern residents eat a higher proportion of "country food", particularly fatty meats, than most of their counterparts in lower latitudes. Because the fatty meats and organs of both marine and terrestrial animals in the Arctic are major concentrators of organochlorines and heavy metals, human populations may accumulate serious amounts of toxic contaminants.[23]

Careful study of the diets and chemical physiology of residents in arctic communities has shown that persons whose diet includes a high percentage of local meat have, in fact, a higher level of identifiable "chemicals used only in the South" (i.e., from agricultural pesticides) in their body tissues and mothers' milk than those who import most of their food from the South. In Canada, this situation is not yet serious; but it needs to be watched carefully.[24]

The relatively sparse population along northern coast lines in the past have meant that sewage and municipal wastewaters were localized and of relatively low concern. Increases in population and economic activities in costal areas demand the expansion of supporting infrastructure, which in turn leads to increasing environmental burden and alterations in costal habitats and waters.

[21] http://www.carc.org/pubs/v18no3/1.htm
[22] Id
[23] Id
[24] Id

Wastewater contains suspended solids organics, nutrients, toxic compounds, and pathogens, all of which can affect the environment and human health. Treatment facilities are often nonexistent or inadequate. The Arctic presently has limited ability to deal with any of its human generated products, and the coast of transporting waste to the south is prohibitive.[25]

The remoteness of the North has led to a certain cavalier attitude with respect to the disposal of wastes.[26] In particular in the northern territories of the Russian Federation, the coastal sea was too often used as a cheap disposal option for nuclear and industrial wastes of all types.[27] In North America, during the height of the cold war, the establishment of defense bases was not undertaken with environ- mental protection as a high priority.[28]

Marine transportation is an essential part of trade and economy, but the opportunities it creates also bring environmental issues that require careful regulation and management.

2.1.Persistent Organic Pollutants (POPs) and other hazardous substances.

. POPs are of particular concern to human health and the environment as they are toxic, persistent and bio accumulative, and are subject to long range transport and deposition in remote parts of the world, far from their original sources in more heavily populated regions.

. The consumption of food in which POPs are bio accumulated is a major factor in contaminant intake and indigenous groups are exposed to levels that exceed established tolerable intake levels.[29]

. POPs have the potential to interfere with a number of biological systems of wildlife and humans and the effects can include reduced fertility, increased birth abnormalities, metabolic and behavioral abnormalities, and compromised immune systems.[30]

Arctic Native people are sustained by local food chains and are mainly exposed to hazardous

[25] http://arctic.journalhosting.ucalgary.ca/arctic/index.php/arctic/article/view/106/140
[26] Id
[27] Id
[28] Id
[29] *The Arctic Council Regional Programed of Action for the Protection of the Arctic Marine Environment from Land-based Activities (RPA),* 1998

[30]Id

chemicals through their diet.[31] Studies also demonstrated alarmingly high levels of hazardous chemicals in breast milk and blood samples taken from the Arctic Indigenous population, some levels among the highest measured in the world[32]

The POPs are known to spread out to regions where they have never been used or produced, through what is also called the grasshopper effect, having impact to the environment and human health all over the globe instead of having impact only regionally.[33]

In addition to the health issues, contamination poses also another kind of risk to the indigenous communities. When traditional food is no longer available, or at least not favorable, a rich part of their culture becomes threatened or can even disappear. This seems especially unfair, since most of the POPs come from south and are not and have never been used in the Arctic communities.

2.1.1. International law on POPs

Today, there exist three major international Conventions exclusively regulating hazardous substances like POPs and heavy metals and one convention concentrating on the marine pollution from ships. These conventions do not apply only in the Arctic, since transboundary pollution is a problem of the whole planet, but play a significant role in the Arctic context due to the "grasshopper effect".

2.1.2. The 1979 Convention on Long-range Trans-boundary Air Pollution.

The POPs protocol bans the production and use of some of the most hazardous substances, schedules the elimination and restricts the use of others. The Heavy Metal Protocol targets three particularly harmful metals: cadmium, lead and mercury, laying down stringent limit values for emissions from stationary sources and suggests best available techniques (BAT) for these sources.

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[31] David Leonard Downie, Terry Fenge**, Northern** *Lights against POPs: Combatting Toxic Threats in the Arctic*, 2003

[32] Id

[33] http://www.arcticportal.org/features/707-persistent-organic-pollutants-a-great-environmental-and-human-risk-in-the-arctic

2.1.3 The Stockholm Convention on Persistent Organic Pollutants.

Adopted in 2001, aims at reduction and gradual elimination of POPs altogether. Since there exists no scientific consensus on the causal link between POPs and hormonal abnormalities or risk of cancer is the Convention built on the precautionary principle, principle widely used in environmental law. The convention is governed by the Conference of the Parties, which convenes every two years. There are also several subsidiary bodies established under the Conference of the Parties that in conjunction with the Convention Secretariat take care of the every day administration of the Convention.

2.1.4 The 1989 Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and they're Disposal

It defines and regulates the management and disposal of hazardous wastes. The main objective of the Basel Convention is "environmentally sound management" the aim of which is to protect human health and the environment by minimizing hazardous waste production whenever possible.

2.1.5 International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 (MARPOL)

Is also one of the corner stone conventions concerning POPs and heavy metals in the Arctic. The convention aims at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations.

2.1.6 Arctic Council

It has been active in researching and promoting the issue of POPs and heavy metal pollution in the Arctic.[34] It initiated Regional Program of Action for the Protection of the Arctic Marine Environment from Land-based Activities (RPA) in 1998. It further established Arctic Council Action Plan to Eliminate Pollution of the Arctic, which in 2006 was given working group status under the name Arctic Contaminants Action Program (ACAP). ACAP aims at preventing adverse effects, reducing and ultimately eliminating pollution in the Arctic

[34] http://www.arcticportal.org/features/707-persistent-organic-pollutants-a-great-environmental-and-human-risk-in-the-arctic

Environment.[35] Norway was the first Arctic country to establish an Arctic Policy in 2006 under the name "Norwegian High North strategy" and today, seven out of the eight Arctic Countries have an Arctic policy in addition to the EU Commission communication on European Union and the Arctic region.[36]

According to the strategy indigenous people will continue the work towards a national solution, which will meet the minimum requirements of the ILO Convention on Indigenous and Tribal Peoples no.169.

2.2. Heavy metals in the Arctic

Heavy metals occur in all Arctic marine ecosystems as a result of natural sources. The collection of heavy metals data from Arctic continental shelf sediments has been enchanted because of the necessity to establish baselines to monitor anthropogenic contamination and concerns with regard to exposure to toxic metals on Arctic marine ecosystems.[37]

Regional differences in metal burdens in marine mammals for lead and cadmium strongly imply that tissue concentrations depend largely on regional geology and biogeochemistry.[38]

Coal burning in Western Europe and North America has been a prime source of heavy metal pollution in the Arctic. Scientists plotted levels of thallium, cadmium and lead in a Greenland ice core and linked them to other chemicals indicating coal as the main origin.[39] Legislation has reduced the heavy metal load in recent years.

Heavy metals are among substances that bio-accumulate; when they pass into animals, they stay there, immune to digestion and the body's waste removal processes. When that animal is eaten by another higher up the food web, the predator, whether human or not, generally takes on a substantial part of the toxic cargo.

As mentioned above, one of the priority pollutants in the Arctic is mercury, which is toxic to

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[35] Id
[36] Id
[37] Muir, D.C.G., R, Wagemann, B.T Hargrave, D.J. Thomas, D.B. Peakall & R.J. Norstrom, "*Arctic marine ecosystem contamination.*" *Science of the Total Environment*. 122 (192): 75-134.
[38] Supra note 19
[39] http://news.bbc.co.uk/2/hi/science/nature/7568748.stm

all living organisms. Analyses show that a significant increase in mercury deposition occurs during the polar sunrise, triggered by photochemical reactions in the surface layer of the atmosphere, transforming mercury to a form easily deposited and absorbed by organisms.

2.3. Physical alteration and destruction of habitats in Arctic

Prevention of habitat destruction and physical alteration has become a much higher priority due to the increasing effects of climate change and its impact on sea ice and permafrost. Pollutants can harm, or even destroy, marine and coastal habitats that support livelihoods, human health, economic growth, biodiversity, shoreline protection, and cultural and spiritual assets.[40]

Physical alteration and destruction of habitats is considered a major threat to the preservation of biological diversity on a global scale. In the Arctic, this remains mainly a local concern.[41]

UNEP is implementing a National Plan of Action for the Protection of the Arctic Marine Environment of the Russian Federation, which is being supported by The Global Environment Facility.[42] This will set out the mandates of the Russian Federation and local governments on environmental impact assessment in the Russian Arctic marine regions.[43]

Physical habitat alterations result in changes to the biological structure and function of the estuarine, coastal and ice environments.[44] The biological impacts on these environments include lowered spring primary productivity, lowered benthic invertebrate productivity, changes in ice characteristics and the timing of break-up, and changes in the distribution and survival of fish (larval, juvenile and adult stages), marine mammals, coastal waterfowl and seabirds. All of these changes can impact negatively upon people who rely on the aquatic environment for subsistence.[45]

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[40] http://www.unep.org/ecosystemmanagement/Portals/7/Documents/factsheets/Mainstreaming%20FactSheet%20web.pdf
[41] Supra note 19
[42] http://www.npa-arctic.ru/html/main_page.html
[43] Id
[44] Id
[45] Id

2.4. Radionuclides

The majority of radionuclides that have entered the Arctic originate from atmospheric fallout of nuclear weapons testing that took place between 1952 and 1978, and the accident at the Chernobyl nuclear power plant in 1986.[46]

Several institutions and programs, e.g., International Atomic Energy (IAEA), Norwegian Radiation Protection Agency (NRPA), and the Arctic Monitoring and Assessment Programme (AMAP), have studied the radionuclides in the Arctic Ocean intensively.

The greatest potential for radioactive contamination of the Arctic is associated with potential sources, including the release of radionuclides due to accidents during production, transport, waste disposal, and storage: natural events such as floods or storms, which can release, mobilize, or redistribute contaminants; and accidental releases.[47]

Of particular concern is the high concentration of radioactive in northwest Russia, mainly in the form of decommissioned nuclear submarines of the Russian Pacfic Fleet and also the handling and storage of spent nuclear fuel poses the risk of releasing significant quantities of radionuclides into the Arctic environment.[48]

2.5. Petroleum hydrocarbons

The anticipated increase in hydrocarbon exploration and production in the Arctic may have a major impact on the marine environment. The risks of oil pollution from onshore oil and gas operations are associated with the catastrophic release of oil. The effects of such a release would not be of regional significance, but they could become of sub-regional significance if large amounts of oil were to reach the Arctic marine environment. Severe local and sub-regional problems have occurred recently, associated with the development and transportation of oil and gas.[49]

- [46] Nilsson, A.1997. *Arctic Pollution Issues: A State of the Arctic Environment Report*. Oslo: Arctic Monitoring and Assessment Programme. Ottawa: Indian and Northern Affairs Canada. 188 p.
- [47] The Ocean Conservancy, *Health of the ocean,2002 Report, at 17-18, available at* http://www.oceanconservancy.org
- [48] Id

[49] Supra note 29 p.9

The greatest environmental risk for hydrocarbon pollution derives from the exploitation and transport of oil and gas resources. Operational discharges of oil from ships and runoff land, discharges in wastewater, and atmospheric deposition add to the pollution.[50]

Generally, petroleum hydrocarbon concentrations are low in the Arctic environment. The largest contributor is oil spills, followed by industrial activity. Although human inputs only make up a small part of the overall petroleum hydrocarbon pollution in the Arctic at present, they can be responsible for considerable local pollution. However, as described above, oil and gas activities in the Arctic are expected to intensify considerably, and if they do as projected, these activities may continue an increasingly significant proportion of input of petroleum hydrocarbons to the Arctic during the next few decades.[51]

2.6. Sewage and nutrients

The increase in coastal infrastructure due to resource developments and the associated pressures from population increases may cause local problems resulting from sewage. These issues will be compounded by climate change, leading to permafrost loss and coastal area erosion, which will lead to increased drainage of lakes and additional nutrient burdens in river outflows that may impact coastal ecologies and habitats.[52]

The addition of nutrients to the marine environment is not a problem in the Arctic, except where input of sewage may lead to localized over-productivity and eutrophication.[53]

Sewage disposal is a local concern for virtually all-coastal communities in terms of public health and environmental effects because conventional sewage treatment systems often do not work well in the Arctic. Further, coastal erosion is threatening to breach sewage lagoons, which could contaminate marine waters.[54]

2.7. Sediments

Natural sedimentation and siltation are important in the development and maintenance of numerous coastal habitats. Reduction in natural rates of sedimentation can compromise

[50] Lilly Weidemann, 2013, *International Governance of the Arctic Marine Environment-with particular emphasis on high seas fisheries,* p 12
[51] Huntington *et al*., Arctic Oil and Gas 2007. AMAP, Oslo 2007, p. Vi.
[52] Supra note 9 p.17
[53] Supra note 46 p.189
[54] Supra note 9 p.17

habitat integrity, as can excessive sediment load, which may bury benthic communities and threaten sensitive habitats.[55]

2.8. Litters

During the early 1980s, shoreline litter surveys conducted on the southern Beaufort Sea indicated that over 90% of the wastes sighted along the Beaufort Sea shoreline had originated from oil and gas exploration activities. The studies concluded that the wastes had minimal biological impact but did have a negative aesthetic effect.[56]

Litter threatens marine life through entanglement, suffocation and ingestion, and is widely recognized to degrade visual amenities. Sources of littler include numerous human activities, and poorly managed or illegal waste dumps.[57]

Adopted by the Arctic Council at its first ministerial meeting in 1998,[58] the Regional Programme of Action for the protection of the Arctic Marine Environment from Land-based Activities was revised by the sixth ministerial meeting in 2009.[59] The programme recommends several specific management strategies and action that Arctic States should take at both international and regional levels to address the pollution of the Arctic from land-based sources and activities, such as physical destruction of habitats, radionuclides, petroleum hydrocarbons, sewage and nutrients, sediments, and litter with a special focus on POPs and heavy metals.[60]

- [55] Id
- [56] *Dobrocky Seatech Ltd. 1985*. 1982-83 Beaufort Sea Shorebase Monitoring Programme, Statistical Analysis and Recommendations for Future Programmes. Yellowknife: Indian and Northern Affairs Canada, p191.
- [57] Id
- [58] Arctic Council, *Iqaluit Declaration,* 18 September 1998, Iqaluit, Canada. *http://arctic-council.org/section/documentation.* Para. 16.
- [59] Arctic Council, *Tromsø Declaration,* 19 April 2009, Tromsø, Norway. *http://arctic-council.org/section/documentation*
- [60] Id

Chapter 3

Legal regimes for land based sources of marine pollution in Arctic

3.1 Introduction

The world community has become increasingly aware that the oceans are interdependent, and consequently, impacts of land-based sources of marine pollution from one country, affects others through the movement of ocean currents.[61]

The foundation for international laws for the control of land-based marine pollution is laid in customary international law (CIL). However, due to the very vague and general terms of CIL rules, several international initiatives have been undertaken to more specifically formulate controls on land-based sources of marine pollution.

3.2 Customary International Law and General Principles of Law

Regulation of marine pollution, in particular land-based marine pollution, is a novel phenomenon in the law of the sea. Owing to the paucity of State practice in this area, it is not surprising that customary law contains few rules relevant to the question of marine pollution.[62]

CIL is a common framework for international relations, being accepted by states as the body of binding rules between them.[63]The CIL comprises two interrelated elements: A consistent and general international practice amongst states; and Acceptance of this practice as law by the international community.[64]

Before December 2001, there was no specific judicial judgment of any rule in CIL which directly related to land-based marine pollution control by the International Court of Justice (ICJ), or any other international tribunal.[65]However, in December 2001 a judgment on a land

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[61] Dan Walker, September 2002 at www.mtsociety.org/Public_outreach/danwakker.pdf
[62] L. J u d a, International Law and Ocean Use Management: The Evolution of Ocean Governance, London 1996, 103

[63] Article 38(1)(b) of the Statue of International Court of Justice.
[64] Supra note 4 p 70
[65] Id

based marine pollution the International Tribunal handed down matter for the Law of the Sea (ITLOS) in the MOX Plant Case.[66]

Probably the most important customary rule on this issue would be that no State has the right to use or permit the use of its territory in such a manner as to cause injury in or to the territory of another State. The rule of *sic utere tuo ut alienum non laedas* (use your own property so as not to injure that of another) was explicitly expressed in the *Trail Smelter* arbitration (1938-41). [67]

No state may conduct, promote or sustain in its territory activities, which cause other than inconsiderable and usual damage in the territory of a neighboring state.[68] An express reference to this principle has been enunciated in Article 74 of UN Charter[69]

3.2.1 The Trial Smelter Arbitration

In a decision regarding this case, the tribunal applied the principle of *sic utere tuo* and stated:

… Under the principle of international law, as well as of the law of the United State, no state has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.[70]

Although the case concerns air pollution, it has direct relevance to other problems of extraterritorial damage including those caused by marine pollution from land-based sources:

(a) It dealt with extraterritorial damage arising from pollution of a shared environmental resource; (b) pollution was caused by the discharge of harmful chemicals from a fixed

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[66] *The MOX Plant case (Ireland v United Kingdom),* Order 3 December 2001 at<http://www.itlos/start2_en.html>

[67] *The Trial Smelter case,* International Environmental Law Reports, vol,1, Cambridge 1999, 310.

[68] Hakappa, K., *Marine Pollution in International Law-Material Obligations and Jurisdiction,* Suomalainen Tideakatemia, Helsinki,1981 at 141.

[69] Article 74 states: Members of United Nations also agree that heir policy in respect to the territories…must be based on the general principle of good-neighborliness, due account being taken of the interests and well-being of the rest of the world, in social, economic, and commercial matters. United Nation Organization, *Charter of the United Nations,* Signed at the United Nations Conference on International Organization, San Francisco, California, June, 1945. Washington D.C., Us Government Printing Office, 1945.

[70] *American Journal of International Law,* (1941), Vol. 35 at 716.

installation on land whose operation was not unlawful per se; and, (c) the basis of the responsibility of Canada was the exclusive territorial jurisdiction it exercised over the activities of the industry.[71]

However, this principle is not merely a reflection of the dictum *sic utere tuo,* but accords with the doctrine of equitable utilization.

3.2.2 The Corfu Channel Case

The Corfu Channel Case was related a large number of deaths and injuries to British seamen when two British destroyers (Saumarez and Volage) struck seamines in Albanian territorial waters in the Corfu Straight on October 22, 1946.[72]

It is a State`s obligation to take measures, within its power, to prevent environmental damage where it knows, or ought to know, that an activity being undertaken on its territory is causing, or may cause, environmental damage.[73]This requirement is acknowledged in the *Corfu Channel Case.* It was held, the principle of sovereignty incorporates: the obligation of every state not to allow its territory to be used for acts contrary to the rights of other states.[74]

This case addressed a situation in which the injurious act had taken place within the territory of the responsible State and where the State was not entitled to use its territorial waters in a manner detrimental to the rights of other states.

The Court decided that Albania was responsible, under international law, for the explosion in Albanian water and the damage and loss of human life, which resulted there from. It thereby ordered that Albania pay compensation to the United Kingdom.[75]

Although this case did not have explicit application to land based maritime pollution control, it imposed obligations on states that are relevant to land based maritime pollution control. It has pronounced that harmful activities, which affect others, are not permissible and generate

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[71] Kuwabara, S., *The Legal of the Protection of the Mediterranean against pollution from Land-based Sources,* Tycooly International Publishing Limited, Dublin, 1984 at 31.
[72] Corfu Channel Case (*United Kingdom v Albania) 1949,*ICJ Report 4.
[73] Wallace- Bruce, N.L., *State Responsiblity,* in Blay, S., Piortowicz, R. And Tsamenyi, M. (eds), *Public International Law- An Australian Perspective,* Oxford University Press, 1997 p 363
[74] Corfu Channel Case (*United Kingdom v Albania) 1949,*ICJ Report, pp 4, 22.
[75] *Corfu Channel Case* (Assessment and Compensation), ICJ Reports, 1949 at 244.

an obligation to make reparations. Release of land based maritime pollution is a harmful activity that can affect other states and is covered by analogy.

3.3. The UN Convention on the Law of the Sea (1982)

At present, the 1982 LOSC is the only treaty, which provides general obligations to prevent land-based pollution at the global level. In this respect, Article 194 (1) obliges States to take all measures consistent with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source, using for this purpose the best practicable means at their disposal and in accordance with their capabilities.[76]

It is apparent that land-based pollution is covered by this provision. Article 194 (2) further imposes a duty upon States to take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment; and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with the 1982 LOSC. In addition, Article 194 (3) (a) stipulates that measures taken pursuant to Part XII shall include, *inter alia*, those designed to minimize to the fullest possible extent "the release of toxic, harmful or noxious substances, especially those which are persistent, *from land-based sources*, from or through the atmosphere or by dumping" (emphasis added). In so providing, it is argued that the 1982 LOSC marks an important advance over the earlier Geneva Conventions, which covered only limited sources of marine pollution.[77]

More specifically, the 1982 LOSC provides prescriptive and enforcement jurisdiction relating to the regulation of land-based pollution. With respect to prescriptive jurisdiction, Article 207 (1) calls upon States to adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources, "taking into account internationally agreed rules, standards and recommended practices and procedures".

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[76] J.I. C h a r n e y, *The Marine Environment and the 1982 United Nations Convention on the Law of the Sea*, 28 The International Lawyer 886-887 (1994). Furthermore, the 1982 LOSC obliges States to pro- vide appropriate assistance especially to developing States. See Articles 202, 203.

[77] P. Birnie /A. Boyle , International Law and Environment, 2 ed., Oxford 2002, 352.

In relation with this, Article 207 (3) places an explicit obligation upon States to endeavor to harmonize their policies in this connection at the appropriate regional level. Furthermore, Article 207 (4) obliges States to endeavor to establish global and regional rules preventing pollution from land-based sources, and to harmonize their policies in this connection at the appropriate regional level. Concerning the enforcement jurisdiction, Article 213 ensures that States shall enforce their laws and regulations adopted under Article 207 and take other measures necessary to implement applicable international rules and regulations. States are also under the duty to take other measures as may be necessary to prevent, reduce and control such pollution in accordance with Article 207 (2).

LOSC clearly applies to both the Arctic and Antarctic marine areas, two major differences in application differences in application stand out in light of the presence of recognized costal states and port states in the Arctic but not in the Antarctic. Many of the Conventions provisions focus on clarifying the right and responsibilities of costal states in the five zones of national jurisdiction, internal waters, the territorial sea, a contagious zone, the exclusive economic zone (EEZ) and a continental shelf. [78]

States must take into account: internationally agreed rules, standards and recommended practices and procedures; characteristic regional features; the economic capacity of developing countries and their need for economic development; and the need to "minimize, to the fullest extent possible, the release of toxic, harmful or noxious substances, especially those which are persistent, into the marine environment".[79]

The LOSC addresses issues related to the protection of the maritime environment from land-based pollution. The Convention confirms and designates costal state authority to create and enforce laws to control marine pollution within their national territories and EEZs, designating minimum standards for dumping regulations. The only direct reference to the Arctic is in Article 234, which establishes the right of costal states to legislate for the "prevention, reduction and control of marine pollution from vessels in ice-covered areas" in their EEZ.

[78] Natalia Loukacheva (ed), *Polar Law Textbook,* Nordic Council of Ministers, Copenhagen 2010, p 45

[79] Art.207 (1), (4) and (5) LOSC

Some argue that these provisions constitute a rule of customary international law. Even if this is the case, these provisions are so general that further specification would be required. In particular, there is a need to establish a specific criterion to identify harmful substances from land-based sources. Furthermore, it should be noted that the obligation preventing pollution from land-based sources in the 1982 LOSC is weaker than that concerning pollution from other sources.

With respect to pollution from seabed activities subject to national jurisdiction, pollution from dumping as well as pollution from vessels, States are under the obligation to adopt laws and regulations, which shall be no less effective than international rules and standards. [80] Concerning pollution from land-based sources, however, States are required only to "take into account" internationally agreed rules etc. when adopting relevant laws and regulations.[81] Thus, States may adopt measures, which are either more or less stringent than those embodied in International Law. In this sense, control by internationally agreed criteria upon national standards remains modest.[82] Moreover, it is also a matter for the judgments of each State what measures shall be taken.[83]

LOSC, despite providing the basic legal framework for the law of the sea, does not claim to cover all aspects of ocean governance, and refer to other international instruments and bodies that have competence in this area. It is important to note that the challenge of managing pollution in a trans boundary context involves as well as international space in the Arctic Ocean.

In conclusion, it may be said that the territorial sovereignty of a State is dominant in the regulation of land-based pollution under the 1982 LOSC, and the balance between national and international laws is clearly in favor of national laws.[84] It should be recalled that these provisions are general in character, their detailed obligations being informed by the content of applicable and relevant international rules, whether global or regional.

- [80] Articles 208 (3), 210 (6) and 211 (2) of the 1982 LOSC.
- [81] Article 207 (1) of the 1982 LOSC.
- [82] A. E. Boyle, Marine Pollution under the Law of the Sea Convention, 79 AJIL 354 (1985).
- [83] Id

[84] A. Yankov, *The Law of the Sea Convention and Agenda 21:* Marine Environmental Implications, in: A. Boyle/D. Freestones (eds.), International Law and Sustainable Development: Past Achievements and Future Challenges, Oxford 1999,280

3.4 Arctic Council's Regional Programme for Action for the Protection of the Arctic Marine Environment from Land-based marine pollution.

Land-based sources of marine pollution still lack regulation both in the Arctic and around the world. Efforts of UN with the Global Programme for Action for the protection of the Marine Environment from Land-based Activities, adopted in 1995, and the Arctic Council`s Regional Programme for Action for the Protection of the Arctic Marine Environment from Land-based Activities, a regional effort adopted in 1998, are possible first steps toward legally binding measures, but remain ultimately non-binding in nature.

Protection of the Arctic Marine Environment (PAME) working group was created to "describe the environment threats to the Arctic marine environment and review the adequacy of existing international instruments pertaining to the Arctic marine environment."[85] Of the bodies that exist under the Arctic Council, PAME has been the one whose mandate has been the most focused on maritime environmental issues. Specifically,

> The PAME working group addresses policy and non-emergency pollution prevention and control measures related to the protection of the Arctic marine environment from land and sea-based activities.[86]

PAME´s first course of action was the review of land-based and marine-based sources of pollution and the existing international instruments. This review determined that no single instrument completely addresses the problems associated with land-based sources of pollution in the Arctic.[87]

Participants at the 1998 Iqaluit Ministerial meeting established five objectives for the working group: 1) to prevent marine pollution from land-based activities; 2) to prevent marine pollution from offshore oil and gas activities; 3) to prevent marine pollution from shipping activities; 4) to implement international agreements and to assess the need for further actions or measures; and 5) to develop and promote integrated and cost-effective action.[88]

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[85] PAME *Report from the First Meeting* (Oslo, 3-5 May 1994).
[86] PAME *Work Plan: Work Plan for the Protection of the Arctic Marine Environment 2000-2002* (August 2000) 1.
[87] Id
[88] Id

A third PAME publication output was revised 2009 version of the Arctic Council Regional Programme of Action for the Protection of the Arctic Marine Environment from Land-based Activities (RPA) (http://www.pame.is/regional-programme-of-action). The RPA, among other things: establishes regional priorities for addressing nine sources categories of pollution with POPs and heavy metals ranked as high priorities; urges Arctic states to ratify key international pollution conventions, including the Stockholm Convention on Persistent Pollutants, the UNECE Convention on Long-Range Trans boundary Air Pollution protocols on POPs and heavy metals; and requests Arctic states to consider the need to set dates for phasing out and providing substitutes for certain POPs in addition to what is require under international agreements.

Land-based sources of pollution is one sector in which the Arctic Council has supported the global law of the sea regime regionally, considering LOSC references to characteristics regional features in article 207 and land-based pollution in article 208. Such Arctic council support is not implementation *per se,* does not arise directly from the LOSC and uses the "practical guidance" of the GPA (Global Programme of Action for the protection of the Marine Environment from Land-based Activities of 3 November 1995) to create a regional program of action rather than binding regional norms, however, this support is nonetheless in keeping with the call in article 208 that states endeavor to establish global and regional "rules, standards and recommended practices and procedure" to combat land-based pollution.

The Arctic Council has actively addressed land-based sources of pollution since at least 1998, when the Arctic Council Ministers first adopted the RPA (Regional Programme of Action for the Protection of the Arctic Marine Environment from Land-based Activities).[89] RPA is a regional extension of the GPA, with the aim of producing practical guidance to combat such pollution, in the context of integrated costal management. The GPA does not mention the LOSC but rather invokes Agenda 21 and the Rio Declaration.[90] The general provision on land-based pollution in article 208 of LOSC, it can be seen as part of it. This raises the question of how explicitly the LOSC needs to be invoked for something to be part of the global or regional regimes for law of the sea.[91] One possible test is whether an action is in

[89] Supra note 29
[90] Id
[91] Erik J. Molenaar, Alex G. Oude Elferink, Donal R. Rothwell, *The Law of the Sea and the Polar Regions: Interactions between Global and Regional Regimes,* Martinus Nijhoff Publishers, Aug 15, 2013, p 55

keeping with, or at least does not contradict, the clearly stated norms in the key instruments underlying the regimes. Arguably, the initiative in question need not invoke the LOSC explicitly but can support the regime by merely furthering its purposes.[92]

The goals for the regional programme of action are: to protect human health, prevent and reduce degradation of the marine environment and costal areas; remediate contaminated areas; support conservation and sustainable use of marine resources and maintain cultural values.

The RPA notes nine sources categories of pollution, which are priorities for regional action. The RPA also sets management objectives. For example, one management objective that at the regional level, Arctic states "should develop and adopt Arctic-wide environmental guidelines on opening, operating and closing mines in the Arctic costal zone. Mining is defined as the extraction, smelting and concentration of ore."[93]

The Arctic Councils RPA is the initiative most comparable to a RSP (Regional Seas Agreements). The RPA is concerned only with land-based sources of marine pollution whereas the RSPs consider all sources, and some deal with marine bio-diversity. The RPA`s goals and principles reflect a range of concepts broader than those expressed in the LOSC buta are compatible with the global law of the sea regime as it has evolved since the LOSC.[94] The principles stated expressly in the RPA include the precautionary approach, polluter pays, ecosystems-based management, adaptive management practices, promotion of biodiversity, full public consultation with transparent processes and duty to cooperate.[95]

The recommendations of the RPA to Arctic Council members are embolismic of how the Arctic Council operates. First, they are recommendations only. The Arctic Council has not imposed any legally binding obligations upon its member states. Second, the land-based activities recommendations include steps that are common to many Arctic Council initiatives:

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[92] Id

[93] Arctic Council, PAME, *Regional Programmes of Action for the Protection of Arctic Marine Environment from Land-Based Activities,* Minister of Public Works and Government Services Canada, 1999. Available on the Arctic Council website.

[94] B.Baker and A. Share, Regional Seas Agreements, in R. Wolfrum(ed) *Max Planck Encyclopedia of International Law* (Oxford University Press: 2008-online edition).

[95] Id., 87

maintaining "a common inventory of significant sources of POPs, heavy metals, radionuclides and petroleum hydrocarbons".[96]

3.5 Regional agreements relevant for land-based maritime pollution in the Arctic.

Pollution from land-based sources is covered by all regional agreements. A number have developed specific protocols or annexes on the matter. The OSPAR Convention, building on its predecessors, the 1974 Paris Convention, has a specific annex dealing with land-based sources of marine pollution.

3.5.1 1992 OSPAR Convention

The 1992 OSPAR Convention has as one of its central objectives the prevention and elimination of pollution from land-based sources, including accidents.[97] It replaces the 1974 Convention for the Prevention of Marine Pollution caused through watercourses, from the coast, from man-made structures and, after the 1986 amendment of the Convention, also from emission into the atmosphere from land or from man-made structures.

The OSPAR Convention incorporates all compatible recommendations and agreements adopted under the 1974 Paris Convention,[98] but further extends its scope. It adopts a border definition of "land-based Sources", which refers to "point and diffuse sources on land from which substances or energy reach the maritime area by water, through the air or from the coast".[99] Parties commit to take all possible measures.[100] Programmes and measures require the use of best available techniques for point sources and best environmental practices for point and diffuse sources, using the criteria in Appendix 2 to the Convention.[101] Substances, which shall be the subject of programmes, include heavy metals, organohalogen compounds, organic compounds, radioactive substances including wastes, and persistent synthetic materials.[102] Under Annex I, all discharges into the maritime area, and releases into water or

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[96] Id., 85
[97] Art.3; and Annex I, Art. 1(3)
[98] Art, 31(2) of OSPAR Convention, Decision 98/1
[99] Art.1 (e). It includes sources associated with any deliberate disposal under the seabed made accessible from land and sources associated with man-made structures, other than for the purpose of offshore activities.
[100] Art.1
[101] Annex I, Art.1 (1) and (2)
[102] Appendix 2, para.3

air which reach and may affect the maritime area, must be authorized or regulated and be subject to a system of regular monitoring to assess compliance.[103]

The parties to the OSPAR Convention have agreed to set and review emission limits for substances reduce discharges and monitor the state of the marine environment. They have also created a number of strategies, most notably the Hazardous substances strategy, the radioactive Substances Strategy, and its revision in 2003, the focus of OSPAR discharges, emission and losses of hazardous substances by the year 2020. To achieve its objective, the Convention keeps list of substances of possible Concern, which includes more than 300 substances, and a list of chemicals for priority Action. On radioactive pollution, the Radioactive Substances are reduced to levels where the additional concentrations in the marine environment above historic levels, resulting from such discharges, emissions and losses, are close to zero. The Commission`s objectives to combat eutrophication were set to achieve a reduction at source, in the order of 50 per cent to compared to 1985, in inputs of phosphorus and nitrogen into areas where these inputs are likely, directly or indirectly, to cause pollution.[104]

The OSPAR Convention lays down some other new approaches to land-based marine pollution control. It does not provide specific obligations with respect to specific categories of dangerous substances, rather it subsumes those obligations under the general obligation of Contracting Parties to prevent and eliminate land-based marine pollution.

This Convention does not provide a list of black and grey list substances. With a view to addressing all potential land-based pollutants to the fullest possible extent, all potential land-based sources are subjected to the same processes of control and eventual elimination. This approach creates border scope for the development of plans for substances which are not listed in the black and grey list, but have harmful effects the marine environment.

Although the provision of the OSPAR Convention 1992 brought new approaches to land-based marine pollution control, they are not beyond criticism. For example, “the broad scope to develop plans” for control of all land-based pollutants is very difficult to implement when

[103] Annex I, Art. 2. The OSPAR commission is required to draw up plans to reduce and phase out certain hazardous substances and to reduce input of nutrients from urban, municipal, industrial, agricultural and other sources: Art.3

[104] Philippe Sands, Jacqueline Peel with Adriana Fabra and Ruth Mackenzie, *Principle of International Environmental Law,* 3rd ed.2012*,* p.376

Contracting Parties have room for dilatory maneuvers on my debatable issues, such as though risk assessments and priority setting processes. Pallemaerts who vote raised questions as to its effectiveness:

…. 1974 Convention has now been replaced by less explicit treaty provision and several layers of interpretive political discourses (Ministerial Declaration, Action Plan, Objective, strategy…) and procedures which tend to qualify the mandate and delay, rather than speed up, implementing action.[105]

3.5.2 UNEP Regional Sea Protocols

Four UNEP Regional Seas Protocols address land-based pollution: the 1980 Athens land-based Sources Protocol (amended in 1996), the 1983 Quito LBS Protocol, the 1990 Kuwait LBS Protocol and the 1992 Black Sea LBS Protocol. The four Protocols follow a combination of the general approach and structure of the 1974 Paris Convention and of the OSPAR Convention, obliging parties to take measures to prevent, control and/or eliminate pollution and standards for use.[106] The amended 1980 Athens LBS Protocol incorporates a broader definition of land-based sources of pollution, as in the OSPAR Convention, but also goes beyond OSPAR`s pollution-abating commitments, setting as its sole objective the elimination of pollution from land-based sources and abandoning its earlier objective to strictly limit certain sources of pollution.[107] IT also incorporates the notions of best available techniques and best environmental practices in setting implementations measures.[108]

Each Protocol provides for: co-operation on guidelines and standards; the systematic assessment of pollution levels and evaluation of the effectiveness of measures; the exchange

[105] Pallemaerts, M., The North Sea and Baltic Sea Land-based Sources Regimes: Reducing Toxics or Rehashing Rhetoric?, *International Journal Of Marine and Coastal Law,* 1998*,* Vol.13, No at 452.
[106] 1980 Athens LBS Protocol, Arts.5 and 6; 1983 Quito LBS Protocol, Art. IV and V (the obligation being slightly less onerous by requiring parties, respectively, to endeavor to prevent, reduce, control and eliminate and to endeavor progressively to reduce).
[107] 1980 Athens LBS Protocol, Art.4-5
[108] 1980 Athens LBS Protocol Art. 5(4)

of scientific and other information and co-operation where water courses flow through the territories of one party is prejudicing the interests of another.[109]

3.5.3 Persistent Organic Pollutants (POPs) Treaty.

The recently concluded POPs treaty gained impetus from scientific studies demonstrating that POPs were present in the tissue, blood, and even breast milk Arctic residents living far from any sources of those pollutants. A statement by the President of Inuit Circumpolar Conference to POPs delegates about the despair of discovering contaminated country food and the fact that Inuit mothers have to think twice about breast-feeding their infants helped achieve the strong treaty.[110]

The treaty implements control measures for the production, use, import, and disposal of POPs. The treaty is designed to reduce and eliminate 12 substances (aldrin, chlordane, DDT, dieldrin, dioxins, endrin, furans, heptachlor, hexachlorobenzene, mirex, PCB, toxaphene), most of which are to be immediately prohibited. A POPs Review committee will regularly review of additional substances for potential addition to the Annexes. Parties are to develop action plans to reduce the total releases of POPs formed the released unintentionally from anthropogenic sources (dixins, furnas, HCB and PCBs), with the ultimate goal of elimination. The action plans are to include the use of substitute or modified materials, products and processes to prevent the formation and release of POPs and preventing the development of new ones. The treaty was concluded in December 2000 and formally adopted and signed in Stockholm in May 2001. The treaty will enter into force upon the 50th ratification.[111]

The agreement contains a preambular paragraph acknowledging the vulnerability of Arctic ecosystems, and especially indigenous communities, at particular risk because of the biomagnification of POPs, and contamination of traditional foods.

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[109] 1980 Athens LBS Protocol, Arts.7-13; 1983 Quito LBS Protocol, Arts. VI-XII; 1990 Kuwait LBS Protocol, Arts. IX and Annex III; 1992 Black sea LBS protocol, Arts. 6,11,13,15 and 16

[110] ICC, *Northern Contaminants and Global POPs Programme,* at http://www.inusiaat.com, and IPEN, *The Arctic POPs and the Recognition of a Duty,* http:// www.ipen.org.

[111] http://www.unep.org/Documents/Default.asp?DocumentID=186&ArticleID=2712 http://www.iisd.ca/linkages/download/asc/enb1554e.txt.

Northern indigenous peoples played s significant in the development of the POPs Treaty, through direct intervention and suggestions for negotiating text POPs preparatory meetings, to media events, to providing a symbolic Inuit carving to the diplomatic chair of meeting.[112]

3.5.4 1974 Land-Based Sources Convention

The 1974 Land-Based Sources Convention is an extension of complement to the 1972 Oslo Dumping Convention. The Convention is open to parties of Oslo Dumping Convention and to states of one or more parties and reaching the geographic area covered by the convention.[113] In addition specifically allows the European Economic Community to accede to the Convention.[114]

Parties to the convention are required to adopt measures to combat marine pollution from land-based sources[115] and to harmonize heir policies regarding such pollution. Parties agree to reduce existing pollution from land-based sources and to forestall any new pollution from land-based sources, including that which derives from new substances.

The goal of the convention is to eliminate pollution by certain substances and to limit strictly the amount of pollution by other substances.[116] Parties are required to adopt specific regulations governing the quality of the environment, discharges into the maritime area, and the composition and use of substances and products. Parties are also required to establish time for completion of pollution-control programs.

Enforcement Mechanisms

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[112] Terry Fenge, *Indigenous People and Global POPs,* in Northern Perspectives, Fall 2000.
[113] Art.2 of the 1974 Land-Based Sources Convention.
[114] Art. 19 provides for specific voting rights for EEC.
[115] Under art. 3(c), "pollution from land-based sources" includes that introduced through underwater or other pipelines from manmade structures placed by a party within the area covered by the convention, and by emissions into the atmosphere from land or manmade structures.
[116] Substances intended to be eliminated are listed in pt.1 of annex A to the convention and include organchalogen compaounds and substsnces, mercury and its compounds, candmium and its compounds, persistent synthetic materials, and persistent oil and hydrocarbons of petroleum origin. Substances permitted only under strict controls are listed in pt. I of annex A, and include organic compounds of phosphorus, silicon, and tin; elemental phosphorus, no persistent oils and hydrocarbons of petroleum origin, arsenic, chromium, copper, lead, nickel, zinc and their compounds; and substances agreed as having a deleterious effect on the taste and/or smell of products derived from the maritime environment of human consumption.

Article 12 of the convention requires each party to ensure compliance with the provisions of the convention and take appropriate measures to prevent and punish conduct in contravention of convention.

Dispute-Settlement Mechanisms

Disputes between parties relating to interpretation or application of the convention are to be settled between them, if possible. If negotiation fails, any one party can request submission of the dispute to arbitration, in accordance with the procedures specified in annex B to the convention.

3.2.5 1992 The Helsinki Convention

The Baltic Sea, surrounded by nine countries (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden) has a population of approximately 66 million living around its drainage basin area. Thus, there is considerable potential for long-range trans boundary atmospheric pollution from the region as well as the potential sources linked to the Arctic.

The Helsinki Convention 1992 promotes precautionary and pollution prevention approaches in various ways. The parties are required to apply the precautionary principle where introduced substances or energy may create environmental hazards. The parties are further required to take all appropriate legislative and administrative measures to prevent and eliminate pollution, so as to promote ecological restoration and to preserve the ecological balance of the Baltic Sea area. Annex 1, dealing with harmful substances, prohibits the use of certain substances, such as DDT and its derivatives and PCBs (except in closed system equipment). The Annex also bans (or at least requires reduction of) various pesticides, among them many types of POPs (persistent organic pollutants).

The Baltic Marine Environment Protection Commission (Helsinki Commission) has adopted numerous recommendations on land-based pollution measures. For example, at its meeting in March 1996, the commission recommended reduction of atmospheric emission from pulp and

paper mills, waste-water discharge standards of chemical industries, emission limits from incineration household wastes and discharge reductions from textile plants.[117]

However, the Convention has not guaranteed strict precautionary and pollution- prevention measures. The Helsinki Convention embraces best available technology for point-sources of land-based pollution. This allows parties wide discretion to consider social and economic factors. The Convention, being of a programmatic nature, does not set detailed standards for industries, but recommendations issued by the commission in the period 1980-91, only twelve (or about one-quarter of all) were reported as implemented by parties.[118]

3.3 Regional Cooperation

In contrast to other marine pollution regimes, there is no comprehensive global legal regime for land-based marine pollution. Within the global legal structure, provisions for land-based pollution are made only through very general obligations or guideline. (E.g. U.N. Convention on the Law of the sea). Regional regimes for the control of land-based marine pollution, on the other hand, typically are more detailed and inclusive by design (i.e., 1992 Convention on the Protection of the Marine Environment of the Baltic sea Area, 1992 Convention for the Protection of the Marine Environment of the North East Atlantic).

In the Arctic Ocean case, it might be justifiable to say that the state of the environment still creates a precondition for using an anticipatory, preventive approach, and that the recently created political circumstances of regional cooperation could be regarded political circumstances of regional cooperation could be regarded as an incentive.[119] However, when it comes to adopting new legally binding commitments among the eight Arctic countries, the situation may be the direct opposite. Here the importance of Arctic Socio-economic and strategic setting emerges, linked in particular with consideration of military security and economic issues. For the former reason, the USA has remained very reserved and restrictive towards any new Arctic international commitments; vital interests of the US Navy pose a

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[117] P.Ehlers, The Helsinki Convention, 1992:Improving the Baltic Sea Environment, 1992:Improving the Baltic Sea Environment, *International Journal of Marine and Costal Law.* Vol. 8. 1993. Pp.191 and 212-13

[118] Id

[119] O.S. Stokke, Arctic Environmental Cooperation After Rovaniemi- What Now?, in L. Lyck(ed), Nordic Arctic Research on Contemporary Arctic Problems(Aallborg University Press,1992), pp. 228-30

major obstacle to a legally binding Arctic regional instrument in the sphere of the marine environment.[120]

Various gaps notwithstanding, the legal regimes reviewed here do provide a basis for increasingly comprehensive protection of the marine environment, although still with land-based pollution as the significant remaining neglected area. Though combined enforcement by polar costal states and also by flag and port states, these legal regimes have wide application. Ultimately, however their effectiveness will depend upon action taken by the polar states through legal and policy responses at the regional and, indeed national levels.

[120] Griffith, *Missing Arctic Waters,* pp 192-201

Chapter 4

Conclusions and Recommendations

Land-based pollution is the most serious source of marine pollution. Nevertheless, the global legal framework for the regulation of land-based marine pollution remains a weak one. The reason for this include:

- Reluctance to restrict economic and industrial activities,
- Complexity of sources, substances and actors involved in land-based marine pollution,
- Geographical and ecological divergences in the oceans,
- Limited capability of developing countries

As a consequence, primarily regional treaties regulate land-based marine pollution. It is notable that new approaches and techniques are increasingly enshrined in these treaties with a view to tightening the regulation of land-based pollution. Such approaches and techniques include:

- The replacement of the black/grey list approach by the uniform approach,
- The precautionary approach
- Environmental impact assessment, and
- International control for ensuring compliance with relevant rules.

However, it must be noted that the development of regional treaties is not uniform, and the normative strength of the regulation also varies according to these treaties. Indeed, the uniform approach seeks to regulate marine pollution from land-based sources in a more comprehensive manner. Furthermore, the precautionary approach requires States to take measures necessary to prevent marine pollution from land-based activities before damage has been caused. Similarly, the obligation to undertake EIA as well as monitoring may serve to narrow States` discretion in environmental policy making. In addition, it is argued that international control mechanisms can be a useful tool to secure the compliance of treaty obligation.

On the other hand, it should be noted that the application of those approaches and legal techniques are qualified by economic, political and social elements. For instance, as discussed earlier, the application of the precautionary approach is qualified by economic, political and social factors. Accordingly, it is conceivable that economic and political factors strongly

influence the implementation of obligations concerning the regulation of the land- based marine pollution.

It would seem that the normative level on this subject relies essentially on economic, social and political environment in a region. It would for example be safe to argue that the 1992 OSPAR Convention contains relatively advanced rules and mechanisms to this matter. An explanation may be that Parties to this convention are essentially developed States, sharing common political and economic systems. Furthermore, apart from Switzerland, those Parties are, at the same time, member States of the European Community. In this regard, it should be remembered that Article 2 of the Treaty Establishing the European Community enunciates that one of the tasks of the Community is to promote "a high level of protection and improvement of the quality of the environment".

The above conclusions reveal that the regulation of land-based marine pollution represents an acute tension between economic development and the environ- mental protection in the international law. On the one hand, regional conventions develop approaches and legal techniques limiting the margin of discretion of States in this field. On the other hand, the application of those approaches and legal techniques must be reconciled with economic, political and social factors of each State. Thus, the validity and effectiveness of legal framework in this field relay essentially on the sound balance between the requirement of the environmental protection and the need for economic, social and political development of each State.

Land-based contamination of the Arctic is clearly an issue that must be addressed by all levels of government. The focus of action will rest with the national policies of the Arctic governments, from which will stem the cohesiveness of action in support of needed global agreements, pan-Arctic compatibility of environmental policies, and the sharing of knowledge through cooperation in monitoring and research. Of equal importance is the partnership within the country to implement national policies in re- source development, management decisions, and environ- mental practices at federal, provincial, and local levels.

Arctic governments have made a good start at regional cooperation with the establishment of the Arctic Council and its many technical programs. Especially important is the involvement of northern peoples, both through their contribution within national delegations under the authorities provided by co-management agreements and through the participation of

permanent representatives. The North is rich in mineral and biological resources, and the further development of the North will create many economic opportunities for Arctic countries. In a sparsely populated and harsh environment, private industries will likely need to shoulder a significant share of the environmental responsibility for sustainable operation of their activities through programs of monitoring and control. Climate change, industrial expansion, and population increases are producing serious environmental impacts with associated influences on northern cultures. The existing cultures and traditional resource use in the North will need to be protected. The governments of Arctic countries will need to give higher priority to northern policies in the future.

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