ASSESSMENT OF IMPACTS OF OIL POLLUTION ON MARINE ENVIRONMENT: AN ANALYSIS

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INTRODUCTION

Over the years, transportation of petroleum has been taking place through vessels and pipelines. Transportation of oil that has been mostly used as a source of energy as well as fuel throughout the world has been very successful through tankers which are specialized vessels for carrying oil.[1]

After the Second World War not only the public interest in the environment increased in general. Concerns of coastal states about increasing ship-source marine pollution and oil spills started to grow as well. Some of the occurred incidents with tankers clearly demonstrated that oil spills in an environmentally or economically sensitive area could cause irreparable damage.[2]

Oil pollution of the ocean comes from shipping activity and offshore oil production. Sea-bed activities on oil exploration and production constitute a relatively small part in the general amount of the pollution of marine environment with oil. The principal cause of marine pollution with oil is shipping. Traditionally shipping is considered to be "a polluting industry".[3] The world's tanker fleet counts approximately 7 000 vessels with cargo capacities between 76 000 and 175 000 tons.[4] Usual shipping operations, especially transportation of oil by tankers and accidents, result in the dumping of around 600 000 – 1750 000 tons of oil into the ocean per year.[5]

CAUSES OF OIL POLLUTION

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[1]Tumaini S. Gurumo & Lixin Han, *The Role and Challenge of International Oil Pollution Liability Legislations in the Protection of Marin Environment*, International Journal Enviormental Science and Development, 2012, page 183

[2] Ekaterina Anyanova, The Institute of State and Law, Russian Academy of Science & OOO "LUKOIL-KMN" Russian Federation

[3]Anianova E., Ehlers P. & Lagoni R., *Tanker or Speedboat?* International Maritime Organizations and their Contribution towards a Sustainable Marine Development, The International Maritime Organization, LIT Verlag, Hamburg, pages 77-103

[4] Birnie P. & Boyle E., International Law and the Environment, Clarendon Press, Oxford, 1992, page 12

[5] Brexendorff A.

There are many chemicals carried at sea are intrinsically far more harmful to the marine environment. Although the impact of the oil pollution constitutes only a small part of a general pollution to the maritime environment, the consequences of oil spills and oil wastes are extremely damaging for marine landscape and ocean's inhabitants.[6]

In general, oil spills can affect animals and plants in two ways: from the oil itself and from the response or cleanup operations. Understanding both types of impacts can help spill responders minimize overall impacts to ecological communities and help them to recover much more quickly.[7]

Spilled oil can harm living things because its chemical constituents are poisonous. This can affect organisms both from internal exposure to oil through ingestion or inhalation and from external exposure through skin and eye irritation. Oil can also smother some small species of fish or invertebrates and coat feathers and fur, reducing birds' and mammals' ability to maintain their body temperatures.[8]

Spilled oil is very toxic. It can be lethal to adult animals even in relatively low concentrations. It may also cause physiological or behavioral disruptions of species. Oil spills also cause death through the prevention of normal feeding, respiration and movement functions not only of ocean wildlife, but also of marine life at the sea shore. Particularly dangerous oil spills are for birds. Oil spill can lead sometime to the tainting of fish and shellfish. Sometimes one can feel the consequences of the oil spills through the oily taste or smell to the seafood. An oil spill directly damages not only animals, plants and corals, fisheries, but also affects human activity in the area of fisheries through damaging of fishing boats, fishing gear, floating fishing equipment.[9]

Under the right conditions the marine environment recovery natural process is incredibly quick and *painless*, however, the internal mechanisms of the nature are not endless and marine environment needs proper treatment and protection. The new oil and gas development projects also raise more and more serious concerns of the environmentalists. For example, the recent decision to start the drilling in the Arctic seriously worried the environmentalists

[6] Brubaker D., *Marine Pollution and international law: Principles and practice*
[7] Clark R.B., Marine Pollution (2nd Ed.), 1989
[8] Dahm G., Delbrueck, J., & Wolfrum, R., Voelkerrecht Band I/2 (2nd ed.), Walter der Gruyter, Berlin, 2002
[9] Dzurek D.J. & Schofield C. Parting the Red Sea: Boundaries Offshore Resources and Transit, IBRU, Durham, 2001, page 34

especially in light of the climate change issue, which have been widely discussed in the mass media.[10] On 29 August 2011 Exxon Mobil Corp and Rosneft signed an agreement on the development of oil and gas in the Russian sector of the Arctic.[11]The region presumably obtains around 13% of the undiscovered oil resources and 30% of its natural gas. Although this project is considered to be highly beneficial for both sides, it is stressed by both sides that environmental safety is very important in this area[12], since this area is considered to be ecologically fragile. Partly the concerns address the transportation of oil and possible oil incidents.[13]

INTERNATIONAL MEASURES FOR THE PROTECTION OF MARINE POLLUTION

In the international law in the course of time a comprehensive regulatory regime on prevention of marine oil pollution (particularly oil spills) was developed. Special attention was paid to the regulation of marine oil pollution by shipping,[14] so the existing rules cover mostly vessel-source pollution. The most effective instruments in the marine environment protection are regional treaties. Almost all regional treaties include a general obligation for signatory states to prevent, reduce and control all forms of maritime pollution. In the Helsinki convention[15]and the Convention for the Protection of the Marine Environment of the North-East Atlantic [16]one can find more concrete clauses like the precautionary concept, polluter pays concept, best available technology, and best environmental practice. However, the elaborated rules need to be enforced and complied with. A closer co-operation and sharing of informational resources within the international community is urgently required, especially in the cases of conventions and their amendments ratification.[17] This chapter is devoted to the existing rules of international law and certain unilateral legislation on the issue of marine

[10] Gautam D., *Trans-Boundary Marine Oil Pollution and Its International Legal Aspects,* Private Law: Rights, Duties and Conflicts, Kierkegaard, S.M. (Ed.), pages 980-988. Copenhagen page 12

[11] Gavouneli M., Po*llution from Offshore Installations*, Graham and Trotman, London, 1995 page 288

[12] Gelberg, L., *Rechtsprobleme der Ostsee*, Sample, Hamburg (1979)

[13] Gennaro, M., *Oil Pollution Liability and Control under International Maritime Law: Market Incentives as an Alternative to Government Regulation*, Vanderbilt Journal of Transnational Law, Vol. 37:265, No. 1, (January 2004), page 265-298

[14] Gold E., *Handbook on Marine Pollution* (2nd Ed.), Assuranceforeningen Gard, Arendal (1998)

[15] Graham S., *Environmental Effects of Exxon Valdez Spill Still Being Felt*, *In: Scientific American*, Available at www.scientificamerican.com/article.cfm?id=environmental-effects-of

[16] Howard R. *How Arctic oil could break new ground*, The Guardian, Available at http://www.guardian.co.uk/commentisfree/2011/sep/02/arctic-oil-exxonmobil-russian-deal

[17] *International Oil Pollution Compensation Fund 1992*, ITOPF, London (2002)

environment pollution with oil as well as their development in the XX-XXI centuries. The liability and compensation schemes in cases of occurred oil pollution are also analyzed. The chapter also deals with the existing regional conventions on marine oil pollution and makes certain proposals on the improvement of the existing at present legislation.

The first international convention on oil pollution was adopted in 1926 by the International Maritime Conference in Washington. This document however was not ratified. Because of the significant pollution especially of the Atlantic Ocean during the World War II (military operations with submarines, torpedoes etc.), since 1945 the issue of oil pollution became very acute and more and more important.[18]

Marine pollution particularly with oil is not clearly regulated in any particular global environmental convention. This form of pollution is considered in some of the international legal documents. The provisions of the international conventions on this issue are, however, relatively limited.[19]

- ***Stockholm Declaration***

  The Declaration on the Human Environment (Stockholm Declaration)[20] and Action Plan[21] were adopted at the United Nations Conference on the Human Environment (UNCHE) held in Stockholm in June 1972. Both documents have special sections on marine pollution. This conference was one of the first attempts of the integrated approach to the global environmental issues.

- ***Global Conventions on the Law of the Sea***

  As a separate issue oil pollution is not regulated in the global conventions on the law of the sea. However, the Geneva Conventions of 1958 contain the provisions on environmental protection of the ocean against oil pollution through oil pipelines or continental shelf development (Art. 5(1) and 5(7) of the Geneva Convention on the Continental Shelf[22] and Art. 24 of the Geneva Convention on the High Seas)[23]. These

[18] Korsunskaya D. & Reddall B. Exxon, *Rosneft tie up in Russian Arctic*, U.S. (Reuters), Available at http://www.reuters.com/article/2011/08/30/us-rosneft-exxon-idUSTRE77T2OM20110830

[19] Valencia M., *Maritime Regime Building*, Martinus Nijh off Publishers, The Hague, (2001)

[20] Declaration of the United Nations Conference on the Human Environment, 1972, Available at http://www.unep.org/Documents.Multilingual/Default.asp?documentid=97&articleid=1503

[21] Action Plan for the Human Environment, 1972, Available at http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=97&ArticleID=1492&l=en

[22] Convention on the Continental Shelf, 1958, United Nations, Treaty Series

[23] Convention on the High Seas, 1958, United Nations, Treaty Series

provisions are, however, rather superficial. Geneva Convention on the High Seas in its Art. 24 proclaim the obligation of states to draft national legislation on pollution prevention from ships or pipelines or sea-bed activities. Art. 5(1) and 5(7) of the Geneva Convention on the Continental Shelf concern the exploration and exploitation of the continental shelf and its natural resources. The coastal state has to ensure that there is no unjustifiable interference with navigation, fishing or the conservation of the living resources of the sea, oceanographic or other scientific research. The coastal states shall also establish safety zones around the offshore installations and take measures for the protection of the living resources of the sea from harmful agents.

- ***Agenda 21 – Programme of action for sustainable development:***
  Another international conference – The Earth Summit, which took place in Rio de Janeiro, Brazil from 3-14 June 1992 – was also very important for the environmental and development issues. This meeting was prepared by the United Nations Conference on Environment and Development (UNCED).The outcome of this conference was the adoption of several non-binding legal instruments,including Agenda 218. Agenda 21 is a programme of action for sustainable action world-wide.

INTERNATIONAL LIABILITY REGIME FOR OIL POLLUTION

The "Torrey Canyon" incident demonstrated that in case of the oil pollution of the ocean there were no rules of international law making the polluter liable. OILPOL'54 left the issue of liability for pollution to the national law.

It was decided to develop international legal scheme with the liability regime for oil spills. The present international regime of compensation for damage caused by oil pollution is based on two conventions: International Convention on Civil Liability for Oil Pollution Damage, 1969 (CLC 1969)[24] and International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971 (FUND 1971)[25].

The CLC 1969 was elaborated within the Inter-Governmental Maritime Consultative Organization and signed on 29 November 1969 in Brussels. It ensures the compensation to be paid. The general principle provided in the convention is that that causing oil pollution should pay compensation. The convention aims to ensure the adequate compensation to victims of

[24] International Convention on Civil Liability for Oil Pollution Damage, 1969. United Nations, Treaty Series
[25] International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971, Available at http://www.iopcfund.org/npdf/Text%20of%20Conventions_e.pdf

oil pollution damage resulting from maritime casualties involving oil-carrying ships. The convention applies to the pollution damage caused on the territory of the Member States to the Convention and related preventive measures (Art. II). The CLC does not apply to ships orvessels owned or operated by a State and used for non-commercial service. The CLC appliesto State-owned merchant fleets.

Convention for the prevention of marine pollution from land-based sources[26] held at Paris on 4 June 1974. Art. 1 puts an obligation on the Contracting Parties to take all possible steps to prevent and combat pollution of the sea from land-based sources. The pollution from land based sources also covers the maritime pollution from installations under the jurisdiction of the member states to the convention including offshore installations and structures.

International Convention Relating to the Limitation of the Liability of Owners of Sea-going Ships, 1957[27] was developed by the Comité Maritime International. It includes the principle of limitation of liability. Besides the liability is limited for ship owners in cases of death, personal injury and property damage claims depending on the tonnage of the vessel. This provision of the convention was often overruled by the courts, so the convention was replaced by the Convention on Limitation of Liability for Maritime Claims, 1976 (LLMC 1976)25.This document sets general limitation of liability. The limitation-rule does not apply in cases of intentional or reckless personal act or omission. By the limitation rule ship owner, charterer, manager, operator, salvers and insurers are covered. Convention on Civil Liability for Oil Pollution Damage Resulting from Exploration of SeabedMineral Resources, 1977 (CLEE 1977)[28] is a liability convention for offshore oil and gasoperations. The convention did not enter into force since there is a developed liabilityregime for oil industry under the bilateral agreements with the involved coastal states.The issue of oil pollution offshore drilling and exploration and exploitation activities is alsoconcerned in a voluntary agreement amongst oil companies operating in northwestern

[26] Convention for the Prevention of Marine Pollution from Land-Based Sources, 1974, Available at http://www.opcw.org/chemical-weapons-convention/related-international-agreements/toxic-chemicals-and-theenvironment/marine-pollution-from-land-based-sources/

[27] International Convention relating to the Limitation of the Liability of Owners of Sea-Going Ships, 1957, Available at http://www.admiraltylawguide.com/conven/limitation1957.html

[28] Convention on Civil Liability for Oil Pollution Damage Resulting from Exploration and Exploitation of Seabed Mineral Resources, 1977, Available at http://www.dipublico.com.ar/english/convention-on-civil-liability-for-oil-pollution-damageresulting-from-exploration-and-exploitation-of-seabed-mineral-resources/

Europe the Offshore Pollution Liability Agreement (OPOL)[29], According to its provisions operators accept strict liability for pollution damage and remedial measures. In aftermath of the "Exxon Valdez" catastrophe under the pressure of the USA the

International Convention on Oil Pollution Preparedness, Response and Co-Operation (OPRC 1990)[30] was adopted in London on 30 November 1990 addressing the issues of response and preparedness of the international community to the oil spills. By means of this convention the International Maritime Organization developed a framework for the international cooperation in combating major oil pollution incidents. The convention stresses in its preamble the serious threat posed to the marine environment by oil pollution incidents and reminds that in case of the oil pollution incident, prompt and effective action is essential in order to minimize the damage. In Art. 6 Convention puts an obligation upon Party States to establish a national system addressing the oil pollution incidents. The convention recognizes the importance of mutual assistance and international cooperation and establishes the basis for the exchange of information respecting the capabilities of states to respond to oil pollution incidents, the preparation of oil pollution contingency plans, the exchange of reports of incidents of significance which may affect the marine environment or the coastline and related interests of states, as well as research and development respecting means of combating oil pollution in the marine environment. The convention also sets a requirement for vessels and offshore units to have on board oil pollution emergency plans.

International Convention on Civil Liability for Bunker Oil Pollution Damage (BUNKER), 2001[31] was adopted to reduce a number of gaps in the CLC regime. This document provides for prompt compensation system for the damage caused by oil spills, when oil was carried as fuel in ships' bunkers. This convention is applied to the territorial seas and exclusive economic zones of the States Parties. The registered owner of the vessel is under the obligation to maintain compulsory insurance cover. A claim for pollution damage could be brought directly against an insurer.

CONCLUSION

[29] Offshore Pollution Liability Agreement, Available at http://www.opol.org.uk/agreement.htm

[30] International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990, Available at http://www.admiraltylawguide.com/conven/oilpolresponse1990.html

[31] Convention on Civil Liability for Oil Pollution Damage Resulting from Exploration and Exploitation of Seabed Mineral Resources, 1977, Available at http://www.dipublico.com.ar/english/convention-on-civil-liability-for-oil-pollution-damageresulting-from-exploration-and-exploitation-of-seabed-mineral-resources/

Although it was scientifically proved that many chemicals carried at sea are intrinsically far more harmful to the marine environment, the impact of oil upon the ocean and its ecosystem is very dangerous. The spillage of even few tons of oil into sea causes a thin film on the water surface, what is deadly for marine life.[32]Since the middle of the XX century not only numerous international legislative measures were adopted in the area of oil pollution prevention for the marine environment, but also national laws and regulations. This new legislation reflected not only the development of the legal position on the certain issues, but also the new developments in construction technology like, for example, improved tank stripping pumps, the load-on-top system, and other technological advances. All these preventive measures considerably reduced both vessel-source and offshore oil development pollution.

Beside the main legal documents on oil pollution and marine environment protection, general principles of international environmental law are also applicable to the cases of oil pollution. Such soft concepts as the "precautionary principle" and "polluter pays principle" could be applied besides these principles being a substantive element of sustainable development are reflected in conventions on liability and compensation in case of pollution (e.g. CLC, FUND etc.)

In comparison to the oil pollution prevention during the offshore oil development pollution, measures against the vessel-source oil pollution represent the better and more detailed regulated area of marine environmental law (the 1954 Brussels Convention for the Prevention of Pollution of the Sea by Oil (OILPOL) was superseded from 2 October 1983 by the 1978 protocol relating to the 1973 International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

The statistics demonstrates that since the beginning of the international legislation on the oceans protection against the oil pollution there had been considerable improvements in the prevention of ship-generated oil pollution. It is not surprising, since the environmental regulation of the industry is becoming wider in its scope and tougher in its implementation.

[32] Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973, as amended, United Nations, Treaty Series

Tanker incident at sea especially close to the coasts always raises the significant attention of the publicity. It should be stressed that 99% of the transported oil (about 1,9 billion tons of oil by some 3 000 tankers) is delivered safely (Gold, 1998).

However, even this tiny amount of the spilled oil is sufficient to cause the irreparable damage. Damage to coastal amenities, beaches, tourist and recreational areas, harbors, offshore installations depends on the geographical location of each spill. For example, a relatively small spill, due to the holing of the tanker "American trader" off the coast of California in1990, caused serious damage. Claims for damage, clean-up costs and fines amounted to over USD[33] million. In the case of the oil spill of the VLCC "Haven" off Genoa in 1991, the French, Italian and even Spanish Mediterranean coasts were damaged. 1 300 Italian claims alone amounted to GBP 705 million.

There exist very good means and instruments to combat the oil pollution, what was demonstrated by clean-up operations after the "Exxon-Valdez" oil spill. There are four major options of responding to marine spills: mechanical containment and collection; use of chemical dispersants; physical shoreline clean-up; and natural removal, requiring no cleanup action. Other counter-measures that are less frequently used due to their limitations are burning, sinking, gelling and enhanced biodegradation. A decision, which clean-up action shall be applied, depends upon a given situation.[34] However, the best clean-up operations won't recover the existed ecosystem. So let the oil pollution never had happened.

[33] Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973, as amended, United Nations, Treaty Series

[34] Gautam D, *Trans-Boundary Marine Oil Pollution and Its International Legal Aspects*, Private Law: Rights, Duties and Conflicts, Kierkegaard, S.M. (Ed.), page 980-988