

State Responsibility and the Environment

LL.M. Paper for the Maters of Law in the European Law

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1. INTRODUCTION

State responsibility is one of the most complex issues in the international law. The trouble of dealing with this complex issue is the difficulty to invoke state responsibility in practice. Even bigger challenge is bringing the concept of state responsibility in connection to the environment. There are so many environmental issues and it becomes very hard to tackle the every form of it. Therefore, this paper tends to present the concept of state responsibility and state liability in relation with the transboundary environmental damage.

Since this paper is about state responsibility and state liability relating to the transboundary environmental damage, the overview will start with the historical development of the concept of state responsibility through the general principles, customary international law and case law. In this development we will see the two main theories (objective theory and fault theory) in the evolution of principle of state responsibility. International Law Commission tried to find a compromise between the clashes of the objective theory and fault theory by working on Draft Articles for Internationally Wrongful Acts (2001). The chapter will continue by describing a distinction between state responsibility and state liability as they represent two different legal concepts. That will lead us to the chapter which will introduce the work of the International Law Commission on codification of the state responsibility. Here we will see some of practical problems and difficulties in invoking state responsibility. International Law Commission does not make any kind of list specifying the wrongful acts that could lead to violation of international obligation. Therefore, international obligations have to be provided by international customary or conventional law. The other obstacle in invoking state responsibility will be proving the causal link between activities and damage. Moreover, the activities of the states can be legal, thus, no state responsibility can be claimed. In light of that distinction between wrongful acts and activities not prohibited by international law, International Law Commission expanded its work and produced Draft Articles and Principles on State responsibility and International Liability for Injurious Consequences Arising out of Acts not Prohibited by International Law. This topic was divided into two parts: the first one that deals with prevention and second that covers the compensation. Draft Articles on Prevention of Transboundary Harm Arising out of Hazardous Activities were adopted in 2001 and Draft Principles on Allocation of Loss in the Case of Transboundary Harm Arising Out Of Hazardous Activities in 2006. It should also be noted that the concept of state liability did not exist in the customary international law. The work of the International Law Commission reflects the progressive development of the international law. The Draft Principles on Allocation of Loss in Case of Transboundary Harm Arising out of Hazardous Activities suggests that the strict liability should be put on the operator or owner and demands financial funds to be established. This was the clear example where work of the International Law Commission covered the field of private international law.

We will see that when the environmental damage occurs, it is surely too late to act. Therefore, emphasis should be put on protection and prevention as well as co-operation to avoid any kind of potential environmental damage. In this part of chapter it will be pointed out if the states accept responsibility to cooperate. Some of the Principles of Stockholm Declaration and Rio Declaration, two soft law instruments, are dealing with prevention and cooperation. Moreover, they have made a solid ground to encourage states to conclude multilateral and bilateral agreements in order to cooperate in the environmental matters.

After the Chernobyl nuclear accident, it was evident that states were reluctant to invoke state responsibility. Even though the accident covered many states, no international instrument was used and states accepted only to cooperate. States usually do not take responsibility for the private activities if the states have fulfilled their due diligence. The lack of the state's will to assume the responsibility for transboundary environmental damage and practical difficulties in invoking state responsibility have led to the transposition of liability to private persons.

Therefore, the following chapter of this paper will deal more with liability regimes for transboundary environmental damage. Ultra-hazardous activities are likely to cause a risk of transboundary environmental damage. First, we will see regimes for nuclear damage. The part of this chapter will introduce the importance for states to establish the supplementary fund mechanism to make sure that the compensation for eventual damage is paid. Strict liability is connected with activities that are considered to be dangerous. Similarly is with the responsibility and liability regimes for marine damage, where the subsidiary funding mechanism also exists. We will see if the rules of state responsibility are additional to the strict liability of private persons. The chapter will continue with overview of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal including the Protocol on Liability and Compensation for Damage resulting from Transboundary Movement of Hazardous Wastes and their Disposal. Developed countries are still using the developing countries by dumping waste on their territory. Therefore, the growing problem of electronic and electrical waste (e-waste) will also be presented and argued if there is solution to prevent the illegal dumping of waste. The chapter will end with brief overview of the latest work of the Conference of Parties of the Convention on Biological Diversity regarding the liability and redress for damage to biological diversity. Attempt to impose liability for damage of biological diversity is becoming more and more important, but the problem of measuring the damage is still present. This issue is still in the process, but we will see how much is achieved in this field.

Third part of this paper will deal with the European liability regime. The overview will start with the regional Council of Europe's Convention on Civil Liability for Damages Resulting from Activities Dangerous to the Environment (Lugano Convention). The Lugano Convention holds the operator liable for incidents that result from a dangerous activity and deal with rather broad scope of environmental damages. The Convention was not well accepted. For that reason, on the level of European Union, the Environmental Liability Directive was adopted. That Directive will also be presented as it brings innovations in liability regime. The Directive obliged the Member States to transpose it within a time limit into their national law. Finally, the Court of Justice of the European Union will have a major role interpreting the European environmental law. Moreover, Court brought its first judgments regarding the implementation of Directive in March 2010. Therefore, three joint cases will shortly be discussed.

This paper will deal with concept of state responsibility and state liability for environmental damage both at international and at European level and it is now in front of you.

2. STATE RESPONSIBILITY AND THE ENVIRONMENT

2.1. History of development of state responsibility (customary law, general principles and case law)

The law of state responsibility is customary international law, developed by state practice and international judgments. 'Principles of state responsibility constituted a baseline enforcement system at the time when public international law begun to engage with the environmental concerns by applying general rules to situation involving environmental harm."¹ Even though the enforcement of public international law is rather limited because states participate on voluntary basis and reciprocal obligations, customary international law is binding on the states, as it is 'evidence of generally accepted state practice and opinion iuris 'accepted as law'. The concept of state responsibility makes an obligation for states to act in conformity with the international agreements or customary law.

Since the concept of state responsibility is applicable to the field of environment, the breaches of treaty or customary international law allow the injured state to lodge claim against injuring (violating) state 'whether by way of diplomatic action or by way of recourse to international mechanism where such are in place with regard to the subject matter at issue².²

The most important principles of environmental protection are imposed by customary international law. Furthermore, some of the main general principles of international law are relevant for state's rights and obligations regarding the environment. One of those principles is the principle of state sovereignty over its territory and natural resources, which is a fundamental and the most important principle of international law in general. Throughout the history states could use their own natural resources in the way they want regardless of the impact to the territory of another state. It is clear that this principle is no longer absolute. The limitation of territorial sovereignty is the obligation of states 'not to act as to injure the rights of other states.'³ Such activities of the state that cares for other countries reflects also the principle of good neighbourliness as well as the principle of state responsibility for causing the environmental damage in case that damage occurs. Principle 21 of the Declaration adopted by the 1972 Stockholm Conference on the Human Environment⁴ has also formulated principle that no state may allow its territory to be used in a way to cause environmental damage:

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.⁵

¹ Tim Stephens, International Courts and Environmental Protection (Cambridge University Press, 2009) p.65

² Malcom N. Shaw, International law, (6th edn, Cambridge University Press, 2008) p.851

³ Shaw (n. 2) p. 851

⁴ Conference on the Human Environment, Stockholm, June 5-16, 1972, Report of the United Nations Conference on the Human Environment and Development, vol. I, UN Doc. A/CONF.48/14/REV.1, January 1, 1973 (Stockholm Declaration)

This Principle was repeated by Principle 2 in Declaration on Environment and Development, adopted by the 1992 Conference held in Rio de Janeiro.⁶ Those were two most important soft-law instruments that have dealt with state responsibility for transboundary harm. Furthermore, those principles are now included in various other binding and non-binding international instruments. For example, it can be found in the relevant provisions of Article 194 (2) of the Convention on Law of the Sea (1982)⁷ and the Convention on Biological Diversity in Article 3.⁸

As far as international case law is concerned, just a few important court and arbitration cases gave solid support to the general principles and made relevant precedents. Those cases are related to the environmental damage that occurred in one state because of the acts in another state.

The decision in the *Trail Smelter* arbitration is one of the most cited decisions by courts and tribunals in the field of state responsibility and the environment. The dispute was between United States and Canada because of the air pollution coming from the Canadian factory and causing the damage to crops in the United States. The tribunal decided:

that under the principles of international law, as well as the law of the United States, no state has the right to use or permit the use of its territory in such manner as to cause injury by fumes in or to the territory of another or the properties of person therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.⁹

This ban of causing harm to other state has been repeated in some other cases, for instance, in the *Corfu Channel case* in 1949. In this case United Kingdom suffered loss of human lives and damage to their vessels because the explosions of mines in Albania's territorial sea. International Court of Justice stressed that it was Albania's obligation to notify and warn about those mines. Court held Albania responsible, set the compensation and declared that obligation of each state is 'not to allow knowingly its territory to be used for acts contrary to the rights of other states.'¹⁰

In the *Lac Lanoux case*, the dispute was between Spain and France about using the lake by France for generating electricity. It was needed to redirect part of the water to another river. Spain claimed that it would affect the interest of Spanish users of river. The tribunal decided 'there was a principle which prohibits the upstream state from alerting the waters of a river in such a fashion as seriously to prejudice downstream state.'¹¹

In the advisory opinion to UN General Assembly on the *Legality of the Threat or Use of Nuclear Weapons* International Court of Justice stated that:

⁶ Conference on Environment and Development, Rio de Janeiro, Brazil, June 3-14, 1992, Report of the United Nations Conference on Environment and Development, vol. I, Principle 2, UN Doc. A/conf.151/26/REV.1, January 1, 1993 (Rio Declaration)

⁷ United Nations Convention on the Law of the Sea, December 10, 1982, 1833 UNTS 3, art. 194 (2),

⁸ Convention on Biological Diversity, June 5, 1982, 31 ILM 822 (1992) art. 3

⁹ Trail Smelter case (US v. Canada), April 16, 1931, March 11, 1941, 3 UN Reports of International Arbitral Awards 1905 (1941)

¹⁰ Corfu Channel Case (United Kingdom v. Albania), April 9, 1949 ICJ Reports 4

¹¹ Lake Lannoux Arbitration Case (Spain v. France), November 16, 1957, 12 UN Reports of International Arbitral Awards 281 (1957)

The existence of the general obligation of states to ensure that activities within their jurisdiction and control respect the environment of other states or of areas beyond national control is now part of corpus of international law relating to the environment.¹²

Furthermore, in the *Gabčikovo –Nagymaros Project case* concerning the construction of a dam on the Danube River, the statement of previous mentioned case was repeated in judgment by International Court of Justice: 'recently had occasion to stress...the great significance that it attaches to respect for the environment, not only for States but for whole mankind.'¹³

The existence of the international obligation or duty between two states, act that violates that obligation and loss or damage that resulted from unlawful act are the conditions for state responsibility. Therefore, it is always crucial to identify the international obligation which has been breached. The real problem of this concept is that state responsibility does not provide any duty for compensation for damage resulted from activities that are not prohibited by international law. Identifying the damaging activity attributable to a state, proving the causal link between act and the damage, determining either violation of international law or violation of a duty of care (due diligence) are three main steps to raise a claim for damages under international law.

2.2. The difference between State responsibility and State liability

Since the terms state responsibility and state liability are sometimes used as synonyms, it is important to make a difference because they present two different legal concepts. When the accidental environmental harm occurs, it is important to determine who should bear the costs for compensation of the damage to the victims. 'International action is generally inter-state, based on doctrines of state responsibility and liability.'¹⁵ State responsibility asserts that state violates an international obligation has to repair harm caused to another state.

According to Kiss and Shelton the *Trail Smelter* case made the basis for 'discussion responsibility and liability in environmental law but left open the question of whether a state executing due diligence would be liable if transfrontier harm results despite the State's best efforts.' As in this case tribunal did not clarify whether the state is liable only for intentional, reckless or negligent behaviour (fault –based conduct) or it should be strict liability.¹⁶ Therefore, in the international environmental law it is necessary to distinguish responsibility, which arises upon breach of an international obligation and liability for injurious consequences of lawful activities.

'State responsibility represents the consequence of, and sanction against, non-performance by states of their international obligations.'¹⁷ Subjective and objective elements are two elements

¹² Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, July 8, 1996 ICJ Reports 226 (1996)

¹³ Gabčikovo-Nagymaros Project (Hungary v. Slovakia), September, 25, 1997 ICJ Reports 7 (1997)

¹⁴ Richard S.J. Tol and Roda Verheyen, 'State responsibility for climate change damages-a legal and economic assessment', Energy Policy, 2004, p. 1111

¹⁵ Alexandre Kiss and Dinah Shelton, *International Environmental Law* (2nd edn, Transnational Publishers Inc, 2000) p. 605

¹⁶ Alexandre Kiss and Dinah Shelton, 'Strict Liability in International Environmental Law', GWU Legal Studies Research Paper No. 345, http://ssrn.com/abstract=1010478> accessed on March 4, 2011

^{&#}x27;Strict liability or objective liability does not depend on the behaviour of the actor, but on proof of causality, a causal link between the inury and the incident. It is important to note that strict liability does not mean that actor was not at fault, but only that fault does not have to be proved.'

¹⁷ Brian D. Smith, State Responsibility and the Marine Environment, (Oxford University Press, 1988) p. 6

that are relevant for state responsibility. The first one mentioned, the subjective element means that the state must be actor of violation of international obligation. The second, objective element means that there must be a breach of an international obligation. When one state breaches international obligation, the other state's rights are bothered.¹⁸ According to Brian D. Smith 'it is not subjective *culpa* but simply fact of violation of international law that serves as the basis for state responsibility. Only fault for breaching of an obligation is required.'¹⁹ Therefore, he distinguishes two types of responsibilities: objective responsibility and fault responsibility. Supporters of objective theory of state responsibility describe that just a violation of international law is relevant for the existence of state responsibility, regardless of the fault of the state. The ground for state responsibility depends on the content of an international obligation.

For a better understanding of the difference between the objective responsibility and fault responsibility it is also important to make a distinction between 'primary' and 'secondary rules'. 'Primary rules' are different rules of international law which impose various obligations upon the subjects of international law. A breach of those obligations may cause the state responsibility. 'Secondary rules' determine the consequences of these breaches and deal with the issues of responsibility and liability. A requirement of fault in the subjective sense may arise only out of the primary obligations involved; *culpa* is not a condition imposed by 'secondary' rules of state responsibility common to all international obligations.²⁰ The supporters of *culpa* theory took the *Corfu Channel case* as an example to justify their point of view. In this case the Court declared that 'state which knows that minefield has been located in its territorial waters would be obliged to notify states of its existence.' However, the court did not mention *culpa* explicitly as a relevant condition for state responsibility, but supporters of fault theory claimed that this was a clear proof that *culpa* is a relevant element for the state responsibility.²¹

This approach, of rejecting objective theory and requiring '*culpa* with respect to responsibility for failure of due diligence, would seem to arise out of confusion of primary and secondary rules.' In other words, there is no breach of international obligation unless the state has the intention or negligent to breach the obligation. The supporters of objective theory do not deny that *culpa* may be condition for the responsibility; they only deny its 'universality' as a secondary rule.²² In contribution to these claims, J.G. Starke is moreover emphasising that 'if the original rule or provision of convention does not envisage malice or culpable negligence, it is difficult to see how this can be invoked as a condition of imputation and responsibility in absence of any elements of culpa.²³ Brian D. Smith holds that in such cases, only the objective doctrine gives a sufficient and logical basis for responsibility. He also stresses that obligations which require no element of *culpa* are those 'obligations entailing strict responsibility', 'responsibility for failure to achieve a required or to prevent a prohibited result without consideration of intent or diligence.²⁴

Many authors²⁵ take for example the Convention on International Liability for Damage Caused by Space Objects (Space Liability Convention, 1972)²⁶ to describe absolute liability of the

¹⁸ Smith (n.17) p. 9

¹⁹ Ibid, p. 15

²⁰ Ibid, p. 16

²¹ Ibid, p. 16

²² Ibid p. 17

²³ J.G. Starke, 'Inputability in International Deliquences', *British Yearbook on International Law*, n. 19 (Oxford University Press, 1938) p.104

²⁴ Smith (n. 17) p. 19

²⁵ Malcom N. Shaw, *International Law* (6th edn, Cambridge University Press, 2008), p.888; Phoebe N. Okowa, *State Responsibility for Transboundary Air Pollution in International Law* (Oxford University Press, 2000) p. 113; Philippe Sands, *Principles of International Environmental Law* (2nd edn, Cambridge University Press, 2003) p. 879, P.Birnie, A.Boyle, C.Redgewell, *International Law & the Environment* (3rd edn, Oxford University Press, 2009) p.518; Louise

launching state to pay compensation for damage caused by its space objects on the surface of the Earth or to aircraft in the flight. The reasoning of this type of liability is that the launching state is the first beneficiary of the launch and therefore must ensure safety and bear responsibility for compensation in case of damage.²⁷ It should be noted that at the time of adopting this Convention, the environmental law has just started to develop. Therefore, definition of damage did not include damage to environment. Damage is defined as loss of life, personal injury, loss or damage to property of states or persons. Making distinction of this absolute liability, strict liability regimes have the clause where operators can liberate themselves from liability for damage caused by certain events such as armed conflict, hostilities, civil war, insurrection and grave natural disasters.²⁸ Space Liability Convention was the basis for claim in case Cosmos 954 in 1978 when radioactive parts of Soviet Union's satellite had fallen on territory of Canada. Canada lodged claim against the Soviet Union for compensation. The Soviet Union did not accept responsibility but the case was settled and it proved that case was well founded in law. This claim is precedent that damage under Space Liability Convention also covers the cost for cleaning up the environment which was damaged by the radioactive parts of the satellite.²⁹

Kiss and Shelton note that the legal consequences of environmental harm cover both the state responsibility for violation of international law and liability for harm caused by activities allowed by state. The latter is strict or absolute liability.³⁰

'States have historically showed great reluctance to initiate proceedings even where the environmental damage is very severe.'³¹ The example of that reluctance is decision not to invoke the responsibility of the Soviet Union regarding the Chernobyl disaster. After the explosion in reactor in nuclear power plant, the radioactive cloud crossed the air above Sweden, Germany, Austria, Switzerland, Italy and the ex Yugoslavia. In this case states accepted only to cooperate, but no other obligation was imposed. That case has shown that states are afraid of possible liability of their own acts in the future. As the states refused to accept liability for transboundary harm, it shifted to civil liability and transposed the liability to the 'operator' or person in control of hazardous activity.³²

The difference between state responsibility and state liability is that liability is based on risk created. The reasoning behind this claiming is that 'state creating risk and benefit from the risk shall also incur the consequences in case harmful injury occurs even for lawful acts.'³³ Karl Zamanek poses a question why should states be strictly liable for activities carried out, not by themselves but by private person on their territory. He notes that the consequence of their sovereignty argues against any liability besides their responsibility for unlawful act to control person on their territory.

Angélique de La Fayette, 'International liability for damage to the Environment' in Malgosia Fitzmaurice and others (eds), *Research of International Environmental Law* (Eduard Edgar Publisher, 2010) p.332

²⁶ Convention on International Liability for Damage Caused by Space Objects, March 29, 1972, 961 UNTS 187 (Space Liability Convention)

²⁷ Space Liability Convention, art. II

²⁸ See Paris Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, 1041 UNTS 358 (Paris Convention) art. 6 (c) and Vienna Convention on Civil Liability for Nuclear Damage, May 21, 1963, 1063, UNTS 265 (Vienna Convention) art. IV (7)(a)

²⁹ Phoebe N. Okowa, *State Responsibility for Transboundary Air Pollution in International Law* (Oxford University Press, 2000) p. 113; Louise Angélique de La Fayette, 'International liability for damage to the Environment' in Malgosia Fitzmaurice and others (eds), *Research of International Environmental Law* (Eduard Edgar Publisher, 2010) p.333

³⁰ Kiss (n. 15) p. 606

³¹ Stephens (n. 1) p. 69

³² Patricia Birnie, Alan Boyle and Catherine Redgwell, *International Law & the Environment*, (3rd edn, Oxford University Press, 2009) p. 518

³³ Georg T. Hacket, Space debris and the corpus iuris spatialis (Edition Frontieres, 1994) p. 156

Answer to that question is that the national economy of the state benefits from that activity in general and the government through revenues in particular. Therefore, the states should compensate damage to another state which does not benefit from that activity. The private persons who economically benefit from those activities should carry liability in a form of civil liability. Only in case of 'partial or total default' state should have subsidiary liability. For example, in case of damage resulting from hazardous activities, state responsibility will be entailed only when rules on international law establish obligatory standard of safety and state on whose territory the 'activities is carried out has failed to impose or to control, although it is internationally bound by the rules.'³⁴ States do not have to wait until the damage occurs to invoke the responsibility. Damage will be just a consequence of neglect and neglect itself gives rise to a state responsibility.³⁵

The state would be responsible for its own violation of international obligation consisting in failure to entail the required standard, to take steps to mitigate the hazards beyond borders or to control implementation. It is about obligation of due diligence and it can be found in various international environmental agreements. Due diligence means that the states are required to adopt legislative and administrative controls applicable to public and private conduct, with the objective to effectively protect other states and the global environment. When the activity involves a risk of significant transboundary damage, the state is required to take all necessary measures to prevent it.³⁶ 'By definition, due diligence is an obligation of conduct, not an obligation of result.'³⁷ In other words, it is obligation of the state to adopt measures in order to avoid the harm to other states, redress damage or punish its actors. Moreover, it is related to the principle of exclusive competence of a state on its own territory. If the activity which may have transboundary harm is performed by an individual on its territory, state on whose territory the activity is performed must make sure to take measures for protection and control in order to prevent the harmful effects.

The Resolution on Responsibility and Liability under International Law for Environmental Damage of the Institute de Droit International from 1997³⁸ makes contribution to a differentiation of responsibility and liability. Article 1 makes the basic distinction between responsibility and liability. Responsibility is described as a breach of an obligation of environmental protection established under international law that engage responsibility of the State, entailing as a consequence the obligation to establish the original position or to pay compensation. The obligation to pay compensation may also incur from a rule of international law providing for strict responsibility on the basis of harm or injury alone, especially for ultra-hazardous activities (responsibility for harm alone). The Resolution of 1997 also explains the civil liability of operators. It can be engaged under domestic law or the governing rules of international law regardless of the lawfulness of the activity concerned if it results in environmental damage.³⁹

Regarding the relationship between state responsibility, state liability and civil liability, Julio Barboza describes the international practice and states that it has developed in 'three different lines'. First one is that there is no state responsibility or state liability. The reason for that there are many international treaties on hazardous activities that focus solely on civil liability and establish no duty for prevention on the state, therefore no state responsibility can be invoked for the breach of a treaty. Those treaties impose no state responsibility subsidiary to operator's liability. He provides

³⁴ Karl Zamanek, 'State Responsibility and Liability' in Winfried Lang, Hanspeter Neuhold and Karl Zamanek (eds), *Environmental Protection and International Law* (Graham& Trotman Limited, 1991) p. 195

³⁵ Ibid, p. 195

³⁶ Birnie, Boyle, Redgwell (n. 32) p. 216

³⁷ Xue Hanqin, *Transboundary Damage in International Law* (Cambridge University Press, 2003) p. 165

³⁸ Resolution on the Responsibility and Liability under International Law for Environmental Damage, 4 September 1977, Strasbourg, 67-II Annuaire de l'institut de droit international 487 (1998) (Resolution of 1997)

³⁹ Resolution of 1997, art. 1

the example for his statement in Convention on Civil Liability for Damage resulting from Activities Dangerous to the Evironment.⁴⁰ The second practice is international '*sine delicto*' liability. There are two types of that state liability. First type is that the state is primarily liable, as mentioned in the Space Liability Convention. Meaning, when the state liability is invoked there is no possibility for civil liability to be invoked at the same time. Here exists only the liability of the launching state. The second type is that state liability is subsidiary to operator's liability, for instance, Paris Convention on Third Party Liability in the Field of Nuclear Energy⁴¹ and Vienna Convention on Civil Liability for Nuclear Damage.⁴² This represents the form of state liability '*sine delicto*' because state pays the sum for compensation instead of the operator or his insurance. Third practice is that the state has subsidiary responsibility for wrongful acts. He gives the example of Convention for Regulation of the Activities on Antarctic Mineral Resources (CRAMRA)⁴³ where the operator is liable for certain damages. For other damages there exists the responsibility of a sponsor state.

The difference between state liability and civil liability is very hard to make, as some of the treaties provide obligation for state to provide public fund where an operator cannot meet certain costs of environmental damage. State liability is defined as liability of state under public international law and civil liability means the liability of natural or legal person under the domestic legislation including the legislation established to implement the provisions of international treaty obligations.⁴⁵

2.3. Work of the United Nation International Law Commission on State Responsibility and International liability

International Law Commission was established by Resolution No. 147 (II), which was adopted by United Nation General Assembly on November 21, 1947. This Commission was set up for promotion of the progressive development of international law and its codification. Primarily, International Law Commission deals with issues of public international law, but is not precluded to deal with the matter of private international law.⁴⁶ One of the duties was the codification of state responsibility. The process of codification began in 1956 and finished in August 2001 when International Law Commission 'produced Draft Articles on the Responsibility of States for Internationally Wrongful Acts.'⁴⁷

⁴⁰ Convention on Civil Liability for Damage resulting from Activities Dangerous to the Evironment, June 21, 1993, 32 ILM 480 (Lugano Convention)

⁴¹ Paris Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, 1041 UNTS 358 (Paris Convention)

⁴² Vienna Convention on Civil Liability for Nuclear Damage, May 21, 1963, 1063, UNTS 265 (Vienna Convention)

⁴³ Convention on the Regulation of Antarctic Mineral Resource Activities, November 25, 1988, 27 ILM 859

⁴⁴ Julio Barboza 'Draft Principles Relating to Liability and Compensation for Damages Arising From the Transboundary Movement of Hazardous Wastes' in Dr. Najeeb Al-Nauimi and Richard Meese (eds), *International legal Issues Arising under United Nations Decade of International Law* (The Hague, Nijhoff, 1995) p. 233, 235 ⁴⁵ Barboza (n.44) p. 235

⁴⁶ UNGA Resolution 174(II) of November 21,1947 art. 1.(1) (Statute of the International Law Commission)

⁴⁷ Report of the International Law Commission, 53 session, UN Doc. A/56/10 (2001) p. 59 (ILC Draft Articles (2001))

2.3.1. Draft Articles on Responsibility of States for Internationally Wrongful Acts (2001)

The approach regarding the state responsibility was to make a clear distinction between 'primary rules' and 'secondary rules' of conduct that can trigger state responsibility. 'Secondary rules' determine the consequences of this breach and deal with the issues of responsibility and liability.⁴⁸ ILC Draft Articles (2001) belong to this 'secondary rules' category. Even though, ILC Draft Articles (2001) do not include the fault and damage as the elements of a wrongful act, those two elements can be foreseen by primary rules. The work of the International Law Commission on the Draft articles was the attempt to find the compromise between supporters of the objective theory and fault theory.⁴⁹

ILC Draft Articles (2001) may form the basis for conclusion of the international agreements which bind the states which have signed and ratified them. The general rule according to Article 1 of the ILC Draft Articles (2001) is that 'every internationally wrongful act of a State entails the international responsibility of the state.⁵⁰ Internationally wrongful act means a breach of a primary obligation which is attributable to a state. Moreover, to invoke the state responsibility one state must prove the breach of the international obligation.

There are two main elements or conditions for invoking the state responsibility of a wrongful act. It is prescribed in Article 2 of the 2001 ILC Draft Articles (2001). The first one is the subjective element, which means that the act has to be 'attributable to the state'. In other words, that only the acts of a state's organs of government or its agents can be attributable to a state. It can be legislative, executive or judicial organ of the state. Moreover, the organ includes the local and regional and national government. However, state practice contains numerous cases in which states have been held responsible for the acts of individuals.

The second is the objective element, which means the conduct of an internationally wrongful act, for which international responsibility is invoked. International obligation must be in force for the state in question at the time of violation.⁵¹ The obligation that has been breached must be of an international character, a condition which can be derived from Article 2(b). Therefore it is not sufficient for the breach to be a violation of the national law of the concerned state. The second meaning of this requirement is that a 'State cannot escape the characterization of its acts as being unlawful by claiming that it is conformity with its own laws.' ⁵² State responsibility can consequently result exclusively from conduct in violation to international law and it cannot be avoided with national legislation.

No differentiation between sources of international obligation is needed. Article 55 explains that ILC Draft Articles (2001) are not applicable if the state responsibility is governed by special rules of international law. For example, if treaty provisions deal with state responsibility or customary international law covers other matters not included in ILC Draft Articles (2001).

The difficulty in proving the causal link between act and the damage is the main problem of invoking the state responsibility. For instance, in the *Trail Smelter* case the causal link between the

⁴⁸ See Paragraph on Difference between State Responsibility and State Liability

⁴⁹ Ibid

⁵⁰ ILC Draft Articles (2001), art1 (1)

⁵¹ Ibid, art 2

⁵² Report of the International Law Commission on the work of its 53rd session and 56th session,UN doc. A/56/10, 2001, (Commentaries on ILC Draft Articles (2001)) p. 74

source of harm and damage was easy to prove. Proving 'direct causal nexus' for transboundary environmental damage, damage to biodiversity or climate change today is very difficult to establish.⁵³

Elli Louka takes for example the air pollution to emphasis the problem of invoking state responsibility for wrongful acts. The air pollution has to be wrongful under the international law in order to consider state responsible. Consequently, in case that this kind of pollution is legal, the state will not be held responsible. In the international law the 'most of pollution does not constitute wrongful act.'⁵⁴ Furthermore, Gerhard Loibl, gives an example of this failure of proving the causality between act and damage by describing the Persistent organic pollutants (POPs). Those substances were used to fight malaria and they had negative effect on human health, plants and wildlife. Nature of POPs substances was specific and it was not possible to detect the state of origin. He gives another example and it is the ozone layer depletion. A state that suffered damage because of ozone layer's depletion will not be attributable to activities in another state. It is obvious from these examples that proving the causal link is the main problem in invoking state responsibility.⁵⁵

The state that breached the rules first must cease the acts which are wrongful and then to make reparation for the damage. Article 35 of the ILC Draft Articles (2001) prescribes that 'full reparation shall take form of restitution, compensation and satisfaction, either singly or in combination.'⁵⁶ Restitution is the obligation of a state that breached international obligation to reduce the effects of breaching and to restore the situation that existed before the breach. In the case of *Chorzow Factory* court declared that:

if the restitution in kind is not possible, payment of a sum corresponding to the value which restitution in kind would bear; the award if need be, of damages for loss sustained which would not be covered by restitution in kind or payment in place of it-such are the principles which should serve to determine the amount of compensation due for an act contrary to international law.⁵⁷

Compensation would mean payment of money as a valuation of the asset damaged because of the wrongful act. Furthermore, satisfaction is linked to non-economic damages. It can include different forms such as formal apology, acceptance of responsibility of formal assurance against future repetition. Those are the consequences of state responsibility.⁵⁸

⁵³ Malgosia Fitzmaurice, David Ong & Panos Merkouris (eds), *Research Handbook on International Law* (Northampton, MA : Edward Elgar Publisher, 2010) p. 307

⁵⁴ Elli Louka, International Environmental Law: fairness, effectiveness and world order (Cambridge University Press, 2006) p. 477

⁵⁵ Gerhard Loibl, Environmental Law and Non-Compliance Procedures: Issues of State Responsibility' in Malgosia Fitzmaurice and Dan Sarooshi (eds), *Issue of State Responsibility before International Judicial Institutions* (Oxford and Portland Oregon, 2004) p. 203

⁵⁶ Alan Boyle, 'Reparation for Environmental Damage in International Law: Some preliminary problems' in Michael Bowman and Alan Boyle (eds), *Environmental Damage in International and Comparative Law* (Oxford University Press, 2002) p. 22

⁵⁷ Chorzow Factory case, Permanent Court of International Law (PCIL), Report Ser. A Nr. 7 (1927)

⁵⁸ ILC Draft Articles (2001) art. 34, 35, 36, 37

2.3.2. State responsibility and International Liability for Injurious Consequences Arising out of Acts not Prohibited by International Law

The concept of State responsibility and international liability for injurious consequences arising out of acts not prohibited by international law was also the product of International Law Commission, particularly for environmental matters. The main idea for drafting these articles and principles is that the International Law Commission wanted to make a distinction from state responsibility and to deal with the legal activities that may cause transboundary damage or harm. Karl Zamanek states that 'no general custom as yet exists which would create liability for harm which is caused to another state either through accident arising out of an otherwise lawful activities or long-range impacts on the environment.' Trail Smelter arbitration and some other cases showed the way towards this trend, but 'not enough to establish a general rule.' ⁵⁹ International Law Commission in that sense also admits that work on the subject of Liability for Injurious Consequences Arising out of Acts not Prohibited by International Law is not codification of customary law but progressive development of international law.

The practice has shown that states did not want to accept the fact that they might be held liable for damage caused by legal activities. For that reason, many states adopted a 'number of civil liability instruments on the prevention of transboundary harm and on liability and compensation should such harm nevertheless occur.⁶⁰ De la Fayette also stresses that regarding the hazardous activities, damage may occur even if the states and operators have taken all the preventive measures. Consequently, state must provide 'legally enforceable system of liability and compensation' in order to protect 'victims of damage caused by hazardous activities.⁶¹

Therefore, the work of International Law Commission focused more on civil liability then on the state responsibility and liability. This was a clear example where their work stepped into the private international law domain. The liability topic is separated into two parts: the first one that deals with prevention and second deals with compensation.

Draft Articles on the Prevention of Transboundary Harm from Hazardous Activities (2001)

According to Article 1 of the Draft Articles on Prevention of Transboundary Harm from Hazardous Activities⁶², they apply to activities not prohibited by international law which involve a risk of causing significant transboundary harm. The state of origin shall take all appropriate measures to prevent significant transboundary harm in the territory or otherwise under the jurisdiction or control. Therefore, states must take all the actions for preventing the risk of transboundary harm or any event in minimizing risk.

Article 2 (d) continues with definition of the state of origin and explains the territory. Namely, the activities to which preventive measures are applicable 'are planned or are carried out'

⁵⁹ Karl Zamanek, 'Responsibility of States: General Principle', in Rudolph Bernhardt *Encyclopedia of Public International Law* (Amsterdam : North-Holland, 1987) p. 356

⁶⁰ Louise Angelique de la Fayete, 'International liability for damage to the environment' in Malgosia Fitzmaurice, David Ong & Panos Merkouris (eds), *Research Handbook on International Law* (Northampton, MA : Edward Elgar Publisher, 2010) p. 320

⁶¹ De la Fayete (n. 60) p. 321

 ⁶² Report of the International Law Commission, 53rd session, UN Doc. A/56/10 (2001) (Draft Articles on Prevention) p.
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in the territory or otherwise under the jurisdiction or control of a State that the activity itself is prohibited. Draft Articles on Prevention do not limit its application only to those activities with 'high probability of causing significant harm', but also include activities with 'low probability' of occurrence of adverse effects, for instance emission from industrialized plants. Therefore, those are foreseeable risks.⁶³

Harm is defined as harm caused to a person, property or environment. Transboudary harm is defined as harm 'caused in the territory of or in other places under the jurisdiction or control of state other than the state of origin, whether or not the state concerned share common border'.⁶⁴ Draft Articles on Prevention are applicable to transboundary harm that is significant. There is no definition of significant harm in the Draft Articles on Prevention, but we can find the explanation in the Commentary by International Law Commission:

'significant" is something more than "detectable" but need not be at the level of serious" or "substantial". The harm must lead to a real detrimental effect on matters such as, for example, human health, industry, property, environment or agriculture in other States.⁶⁵

Moreover, states must cooperate to prevent transboundary harm and take all the necessary legislative, administrative actions including the establishing monitoring mechanism to implement the provisions of these articles into domestic law.⁶⁶ Article 3 puts the emphasis on the prevention. As mentioned before, this obligation is one of due diligence. In the commentary to this Draft Articles on Prevention, there is an explanation of term due diligence:

... due diligence is manifested in reasonable efforts by a State to inform itself of factual and legal components that relate foreseeably to a contemplated procedure and to take unilateral measures, in a timely fashion, to address them. Thus, States are under an obligation to prevent significant transboundary harm or at any event to minimize the risk thereof. Such measures include, first, formulating policies designed to prevent significant transboundary harm or to minimize the risk thereof and, secondly, implementing those policies. Such policies are expressed in legislation and administrative regulations and implemented through various enforcement mechanisms.⁶⁷

After highlighting the general duty of taking all the appropriate measures to prevent significant harm or minimize the risk, the remaining provisions of Draft Articles on Prevention analyze the notification and information, exchange of information and consultation on preventive measures. This issue will be explained in part 2.4. of this paper, as it is already part of some multilateral international agreements.

Draft principles on the Allocation of Loss in the Case of Transboundary Harm Arising out of Hazardous Activities (2006)

The work of the International Law Commission on international liability continued until December 2006, when the Draft principles on the Allocation of Loss in the Case of Transboundary Harm Arising out of Hazardous Activities were adopted.⁶⁸

⁶³ Draft Articles on Prevention, art. 2

⁶⁴ Ibid, art. 2

⁶⁵ Ibid, p. 108

⁶⁶ Ibid, art. 2 d, 3, 4, 5

⁶⁷ Draft Articles on Prevention, p. 393

⁶⁸ Report of the International Law Commission, 58th session, UN Doc A/61/10 (2006) (Draft Principles)

Principle 1 regulates the scope of application and prescribes that Draft Principles will have the same scope of application as the Draft Articles on Prevention. 'Like the Draft articles on Prevention, the activities coming within the scope of the present principles have an element of human causation and are qualified as activities not prohibited by international law.'⁶⁹ They tried to distinguish the principles from the rules governing State responsibility. The International Law Commission recognized the importance, not only the questions of responsibility for internationally wrongful acts, but also questions concerning the obligation to repair any harmful consequences arising out of certain activities, especially those which present certain risks. Furthermore, like the Draft articles on Prevention, the Draft Principles are concerned with primary rules. Therefore, non-compliance of the duty of prevention prescribed by the Draft Articles on Prevention could invoke state responsibility without necessarily giving rise to the implication that the activity itself is prohibited. In such case, state responsibility could be invoked to implement not only the obligations of the State itself but also the civil responsibility or duty of the operator.⁷⁰

According to Principle 3 of Draft Principles the main objectives are to ensure prompt and adequate compensation to individuals and states that suffered transboundary damage and 'to preserve and protect the environment in the event of transboundary damage, especially with respect to mitigation of damage to the environment and its restoration or reinstatement.⁷¹ Moreover, the Principle 4 prescribes that states should take all necessary measures to ensure that prompt and adequate compensation is available for victims of transboundary damage caused by hazardous activities located within its territory or otherwise under its jurisdiction or control and that these measures should include the imposition of liability on the operator or any other person or entity. A proof of fault is not required for such liability. These measures should also include the requirement on the operator or, where appropriate, other person or entity, to establish and maintain financial security such as insurance, bonds or other financial guarantees to cover claims for compensation. Furthermore, in some cases, these measures should include the requirement for the establishment of funds at the national level.⁷²

Elli Louka states that by channelling the liability to a particular person (operator) and establishing liability without fault is aimed to facilitate the position of the victims of transboundary damage. The operator has the most economic benefit from the activity. Therefore, the operator bears the costs for transboundary damage. This principle is accepted in many international agreements that regulate the civil liability. Lugano Convention, oil pollution regime, Basel Protocol are just some examples. States retain the role of providing additional, supplementary compensation to the victims.⁷³

Draft Principles constitute a general framework, according to Principle 7 and states are encouraged to conclude international agreements 'specific global, regional or bilateral agreements' or to adopt in their own domestic legislation adequate measures to ensure adequate compensation for victims of transboundary damage caused by lawful hazardous activities.⁷⁴ The obligation is on state to take all the measures to 'ensure that prompt and adequate compensation is available' for those who suffered of transboundary damage caused by 'hazardous activities located within its

⁶⁹ Draft Principle, p. 118

⁷⁰ Draft Principles, p. 118-119

⁷¹ Ibid, Principle 3

⁷² Ibid, Principle 3, 4

⁷³ Louka (n. 54) p. 480

⁷⁴ Draft Principles, Principle 7

territory or otherwise under its jurisdiction or control.⁷⁵ States prefer the civil liability of private persons dealing with hazardous activities. The practice has shown that the regular case of insolvency of the private person for damage could also cause problem. Therefore, paragraph 2 of the Principle 7 encourages States 'to include in such arrangements various financial security schemes whether through industry funds or state funds in order to make sure that there is supplementary funding for victims of transboundary damage. The regime concerning liability for transboundary damage 'that are best left to the discretion of individual States or their national laws or practice to select or choose, given their own particular needs, political realities and stages of economic development.⁷⁶

2.4. International co-operation for environmental protection

Principles that are included in Stockholm Declaration defined objectives of the environmental protection and actions for fulfilment of those objectives. It was the first attempt to deal with the international co-operation in the field of environmental protection.

Also, Principle 21 of Stockholm Declaration and Principle 2 of Rio Declaration provide the general principle that states have the responsibility to ensure that activities within their jurisdiction or control do not cause damage to environment of other States or of areas beyond the limits of national jurisdiction. General obligation of the state is to prevent transboundary harm. In case they do not 'take all appropriate measures to prevent significant transboundary harm, or minimise the risk thereof' ⁷⁷ they can be held responsible.

International co-operation in environmental matters is becoming very important in order to prevent potential environmental damage. Article 74 of United Nation Charter⁷⁸ provides the principle of good neighbourliness. Moreover, that principle is also extended to environmental matters. The duty of the states for co-operation is stressed in Principle 24 of Stockholm Declaration:

international matters concerning the protection and the improvement of environment should be handled in co-operative spirit by all countries, big and small, on equal footing. Cooperation through multilateral and bilateral arrangements or other appropriate means is essential to effectively control, prevent, reduce and eliminate adverse environmental effects resulting from activities conducted in all spheres, in such a way that due account is taken of the sovereignty and interests of all States.⁷⁹

Principle 7 of the Rio Declaration provides that 'states shall co-operate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem.'⁸⁰

These are two soft –law mechanisms that have outlined general principles for co-operation for environmental protection. More important would be to include those principles in multilateral or bilateral international agreement to give them binding force. Only in that way a state can take procedural steps to prevent transboundary environmental damage.

⁷⁵ Ibid, Principle 4

⁷⁶ Draft Principles, p. 182

⁷⁷ Draft Articles on Prevention, art. 3

⁷⁸ United Nations, Charter of the United Nations, 1945, 1 UNTS XVI

⁷⁹ Stockholm Declaration, Principle 24

⁸⁰ Rio Declaration, Principle 7

Francesco Francioni finds and distinguishes the main areas of procedural environmental cooperation that produced 'significant level of development'⁸¹. These areas are especially important for prevention of any potential environmental harm or damage. According to Francioni, the first step for preventing the environmental harm would be notification or 'prior information relevant to environmental hazard.' The state of origin of the harm has a duty to give information about 'significant transboundary environmental hazard.'⁸² The first precedent of this type of obligation was established in 1949 in the Corfu Channel case. In this case International Court of Justice declared that every state has the obligation to inform the other states that are potentially exposed to serious risk. This obligation is now prescribed in many bilateral and multilateral treaties concerning the prevention and minimization of environmental harm. The recent example regarding the prior information relevant for environmental hazard is the case of the nuclear power plant 'Krško' in the Republic of Slovenia. The problem emerged concerning the cooling mechanism in one of the reactors in that nuclear power plant. That event meant threat to nuclear and radioactive safety to the neighbouring countries. Even though, the lowest level of emergency was declared, Slovenian Nuclear Safety Agency Administration informed the neighbouring counties and International Atomic Agency (IAEA).⁸³ Furthermore, as a Member State of the European Union, Slovenia also informed the European Community Urgent Radiological Information Exchange (ECURIE), which is managed by the European Commission. The European Commission has immediately published press release. Member States, ECURIE and the European Commission have decided that Slovenia did not need to send an alert message. However, Slovenia was following procedure to report even a minor event as well. For that reason, the European Commission prepared more detailed criteria for reporting information to ECURIE system.⁸⁴ In this certain case, there was basically no need for Slovenia to make that prior notification, but in any case, it can do no harm. On the other hand, after the biggest nuclear disaster in Chernobyl and the highest level of radioactivity as never seen before, the information has been kept as a secret for a several days and the Soviet Union failed to inform other states. At that time no international instrument was applied. One convention that dealt with the transboundary air pollution, the Convention on Long Range Transboundary Pollution⁸⁵ excluded radioactivity from the scope of application. This accident was a trigger for improvement of international co-operation in the field of nuclear energy. Therefore, IAEA prepared two treaties that are applicable to nuclear accidents cases at international level. Both conventions were adopted quickly after the accident on the same date, September 26, 1986. The first one was Convention on Early Notification of a Nuclear Accident⁸⁶ that established duty of the state party to provide information without delay of any nuclear accident. According to Article 5 state must give notice about exact time, location and nature of the accident, the installation or activity concerned, the presumed or known cause, the likely evolution of the accident, the general characteristic of the radioactive discharge. Furthermore, the notifying state has to give the information on current meteorological conditions and measures taken or projected outside the site.⁸⁷ The affected states can require further information or consultation to limit the radioactive consequences within their

⁸¹ Francesco Francioni, 'International co-operation for the Protection of environment: The Procedural Dimension' in W. Lang, H. Neuhold and K.Zemanek (eds), *Environmental Protection and Environmental Law* (Graham & Trotman, 1991) p. 206

⁸² Francioni (n. 81) p.206

⁸³ International Atomic Energy Agency (IAEA) <http://www.iaea.org/> accessed February 26, 2011

⁸⁴ Slovenian Report on Nuclear Safety, (Ministry of the Environment and Spatial Planning of the Republic of Slovenia, June 2010) < www.ujv.gov.si> accessed on February 27, 2011

⁸⁵ Convention on Long -range Transboundary Air Pollution, November, 13, 1979, 18 ILM 1442 (1979) (CLRTAP)

⁸⁶ Convention on Early Notification of a Nuclear Accident, September, 26, 1986, 25 ILM 1370 (1986) (Convention on Early Notification)

⁸⁷ Convention on Early Notification, art. 5 (a-h)

jurisdiction.⁸⁸ Each state should indicate to IAEA which should also receive the information and transmit it to each state that requests it.⁸⁹

The other convention was adopted in Vienna and it is a framework for Assistance in the Case of Nuclear Accident or Radiological Emergency.⁹⁰ The objective of this Convention is mutual co-operation between states and between states and the IAEA. Since this was just a framework convention, further co-operation will be established by bilateral or multilateral agreements for minimizing injury and damage resulting from the event of a nuclear accident or radiological emergency.⁹¹ Kiss explains that the convention does not entail certain obligations on states and unfortunately 'refusal of assistance cannot be considered a violation of an international treaty implying international responsibility.⁹²

The worst nuclear accident, after Chernobyl happened on March 12, 2011 in Fukushima in Japan. After the terrible earthquake, potential hazards of radiation escaped from damaged nuclear power plant, polluting the air and the sea. This accident will also show some flaws and limitations of existing legal instruments and will be a trigger for improvement. At this moment at the level of European Union, all states that have nuclear power plants are making stress test for prevention of similar accident. Moreover, the international emergency response framework for dealing with nuclear power plant accidents needs to be reassessed and communications improved in light of the current crisis in Japan, stressed Yukiya Amano the Director General of IAEA. He emphasis that the current emergency response framework was designed in the 1986 after the Chernobyl disaster in the Soviet Union, the worst ever civilian nuclear accident, and before the impact of the so-called information revolution. 'The responsibility of the IAEA is to provide authoritative and validated information as quickly as possible, but doing this under the current arrangements inevitably takes time and has limitations.⁹³ Amano noted the high levels of contamination measured near the plant and the concerns of millions of people in Japan, neighbouring countries and further afield about possible dangers to human health, environmental contamination and risks to foodstuffs. He urged the Japanese authorities to further improve the provision of information to the IAEA.⁹⁴ By this example, it is obvious that many changes and improvements of the existing framework need to be done in order of getting transparent and quick information about hazardous radiation.

The second area of environmental international co-operation is the procedure of consultation. Francioni states that it can be defined 'as process through which a state planning certain activities capable of presenting a transboundary environmental hazard engages in exchange of views with potentially affected state so to make consideration of their interests a component of its final determination'.⁹⁵

As mentioned before, general soft-law principles have made a ground for conclusion of multilateral and bilateral international agreements that now provide framework for co-operation and consultations. It should be noted that those treaties, unlike soft –law, have the binding force. For

⁸⁸ Ibid, art. 6

⁸⁹ Ibid art. 2, art. 7

⁹⁰ Convention on Assistance in the Case of Nuclear Accident on Radiological Emergency, September, 26, 1986, ILM 1377 (1986) (Convention on Assistance)

⁹¹ Convention on Assistance, art. 1

⁹² Alexandre Kiss, 'State Responsibility and Liability for Nuclear Damage', (2006), JIL, 35

⁹³ 'Nuclear emergency response must be upgraded in light of Japanese crises', (UN News Centre, March 21, 2011) http://www.un.org/apps/news/story.asp?NewsID=37834&Cr=japan&Cr1 accessed February 20, 2011

⁹⁴ Ibid

⁹⁵ Francioni (n.81) p.210

example, CLRTAP under Article 5 prescribes that consultations shall be held, upon request, at an early stage between states that are affected by significant long range transboundary air pollution and states that contribute to that pollution.⁹⁶ Furthermore, Article 197 of Law of the Sea Convention provides general principle of co-operation for prevention and reduction of marine pollution. Convention on Prevention of Marine Pollution by Dumping of Wastes and Other Matter⁹⁷ (London Dumping Convention) deals with the obligation of the state to consult before exceptional dumping the hazardous substances. Another example of more original type of consultation is in Antarctic Treaty.⁹⁸ According to that treaty, consultation takes place on regular basis, through consultative meetings. The prior consultations here vary from waste disposal, protection of atmosphere, mineral resource activities to protection of fauna and flora. Euratom Treaty ⁹⁹ prescribes that State Parties have the obligation to provide Commission general data relating to the disposal of radioactive waste. Failure to notify, inform or to consult will entail the responsibility of state, because of not acting in accordance with the international legal norms.

Another important soft-law Principle 13 of the Rio Declaration states that:

'States shall ...cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.'¹⁰⁰

As mentioned before, in case of 'hazardous or risky activities, damage may occur even if the state having jurisdiction and the operator in control take all the appropriate measures of prevention.'¹⁰¹ Therefore, it is needed to enforce the system of liability and compensation. Hazardous activities need special legal instruments. State responsibility itself is not enough, especially because of the problem of invoking it without breaching of international obligation.

⁹⁶ CLRTAP (n.85) art. 5

⁹⁷ Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, December 29, 1972, 1046 UNTS 120 (London Dumping Convention)

⁹⁸ Antarctic Treaty, December 1, 1959, 402 UNTS 71

⁹⁹ Treaty Establishing the European Atomic Energy Community, March 25, 1957 (Euratom Treaty)

¹⁰⁰ Rio Declaration (n.6) Principle 13

¹⁰¹ See Louise Angelique de la Fayette, 'International liability for damage to the environment' in Malgosia Fitzmaurice, David Ong and Panos Merkouris (eds), *Research Handbook on International Environmental Law* (Eduard Edgar Publisher, 2010) p. 321

3. RESPONSIBILITY AND LIABILITY REGIMES FOR TRANSBOUNDARY ENVIRONMENTAL DAMAGE

In the previous chapter we have seen that responsibility and liability regimes for transboundary damage include state responsibility, state liability and civil liability.

Elli Louka precisely notes that 'channelling of liability' to the person in charge is required in order to diminish the transaction costs of finding the responsible person. Person in charge should be liable person. Liability is strict because a fault liability regime would have created further costs of finding whether the person in charge was actually at fault. In case of oil pollution and the sea transfer of hazardous substances, the ship's owner is the person in charge. Furthermore, in case of nuclear pollution, it is the operator or owner of a nuclear power plant. In a case of transport of dangerous goods, it is the transporter. In a case of waste exports, the person who gives a notification to the country of destination that a waste is to take place is the person who is liable until disposer takes control of the waste. Moreover, polluter pays principle is applied in broader version. It means that principle also includes the society as a beneficiary of industrialisation and entails accountability. Therefore, most regimes provide supplementary 'compensatory mechanism supported by entities, which have no control over the specific incidents that give rise to liability, but are responsible in the broader sense receivers of benefits from that dangerous activity.' ¹⁰²

In the nuclear liability regime, the operator is primarily responsible. The states which have the nuclear power recognize that a risk of the nuclear accident should increase sense of solidarity and co-operation. That leads us to the next paragraph where we will see types of responsibility and liability for nuclear damage.

3.1. Regimes for nuclear damage

As already mentioned, there is no general international treaty that prescribes state liability in case of transboundary nuclear pollution. If one state wants to claim the damage from another state, that state should rely on customary international law or principle of state responsibility. 'The tendency of the treaties is to avoid direct implication of the source state in responsibility for damage and to emphasize liability in national law of the operator or company which caused the damage.'¹⁰³ State responsibility is not excluded and civil liability treaties engage the states as a guarantor of operator's strict liability. It includes the providing supplementary compensation funds.

Nuclear activities and transboundary damage are covered by the Paris Convention on Third Party Liability in the Field of Nuclear Energy (Paris Convention)¹⁰⁴ and Vienna Convention on Civil Liability for Nuclear Damage (Vienna Convention)¹⁰⁵. The first one is regional treaty concluded within Organisation for Economic Cooperation and Development. The contracting parties of Paris Convention concluded the Convention Supplementary to the Paris Convention

¹⁰² Louka, (n. 54) p. 448, 449

¹⁰³ Birnie, Boyle, Redgewll (n.32) p. 517

¹⁰⁴ Paris Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, 1041 UNTS 358 (Paris Convention)

¹⁰⁵ Vienna Convention on Civil Liability for Nuclear Damage, May 21, 1963, 1063, UNTS 265 (Vienna Convention)

(Brussels Convention)¹⁰⁶ with the aim to ensure compensation for nuclear damage. Nuclear damage is defined in Article 3 of Paris Convention as 'loss of life and personal injury, loss of or damage to property and economic loss arising from loss of damage'. It was rather a big scope of nuclear damages which implied the impossibility for operator to compensate it in a case of damage. Therefore, two supplementary public funds were established by Brussels Convention in addition to operator's civil liability. One fund is financed from the state where the nuclear power plant is located and the other form contributions of all the contracting parties. The share for contribution to this public fund is grounded on total gross national product of each contracting party and the total of gross national product of all the parties; and the ratio between the thermal power of the reactors of each contracting party and the total thermal power of reactors of all the parties.¹⁰⁷ In 1982 the regime was improved by raising the upper ceiling of public funds when Protocol on Brussels Convention¹⁰⁸ was adopted.

Another Convention covering the liability for nuclear damage is the Vienna Convention. It was only in 1997 when the fund was established by Protocol amending the Convention on Supplementary Compensation for Nuclear Damage¹⁰⁹. This Protocol's amendments extended the definition of nuclear damage and raised the amount of liability for the nuclear operator for each nuclear incident.¹¹⁰ Even though, according the Vienna Convention the operator is absolutely liable for nuclear damage, the claimant can directly bring the claim against the insurer or financial guarantor if it is permitted by national law. State parties contribute for the public fund. 'For the nuclear activities that are directly conducted by the state itself, liability should in principle lie with the state.'¹¹¹

In case the nuclear damage is the result of some internationally prohibited activities, for example dumping radioactive waste into sea, or atmospheric nuclear tests, than the objective responsibility is the result of harm caused in violation of international law and not of the failure of due diligence. The 'channelling of all liability to the operator of nuclear installations simplifies the plaintiff's choice of defendant and establishes a clear line of responsibility.¹¹²

In case of transboundary movement of nuclear waste especially high-level radioactive waste that present high risk General Conference of IAEA adopted Code of Practice on the International Transboundary Movement of Radioactive Waste.¹¹³ According to Article 3(8) it is prescribed that every state has to take appropriate measures to set up in their 'national laws and regulations relevant provisions as necessary for liability, compensation or other remedies for damage that can be result of transboundary movement of hazardous waste.¹¹⁴ The Code of Practice is not legally binding.

¹⁰⁶ Brussels Convention Supplementary to the 1960 Convention on Third Party Liability in the Field of Nuclear Energy, January 31, 1963, 956 UNTS 264 (Brussels Convention)

¹⁰⁷ Brussels Convention, art. 12

¹⁰⁸ Protocol to Amend the Brussels Supplementary Convention to the Paris Convention, February 12, 2004

¹⁰⁹ Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage, September 12, 1997, 36 ILM 1454 (1997)

¹¹⁰ Ibid, art. 7

¹¹¹ Hanqin (n. 37) p. 39

¹¹² Birnie, Boyle, Redgwell, (n.32) p. 517

¹¹³ IAEA 'Code of Practice on the International Transboundary Movement of Radioactive Waste', November 13, 1990 INFCIRC/98 386 http://www.iaea.org/Publications/Documents/Infcircs/Others/inf386.shtml accessed on April 13, 2011

¹¹⁴ Marc Cogen, The comprehensive guide to International law, (die Keure, Brugge, 2008) p.161

3.2. Regimes for maritime damage

After the Torrey Canyon incident in 1969, The Amoco Cadiz disaster in 1978 and wellknown Exxon Valdez oil spill in Alaska, there was a need for improvement of international legal instruments covering the responsibility and liability for accidental oil pollution damage. Accidents like Erika in the 1999 and Prestige 2002¹¹⁵ showed need for further amendments and triggered conclusion of international treaties.¹¹⁶

According to Article 235 of the Convention on Law of the Sea 'states are responsible for the fulfilment of their international obligations concerning protection and preservation of the marine environment. This regulation is valid only before the occurrence of the damage.'

The first international treaty that was dealing with the international transport of oil was the Convention on Civil Liability for Oil Pollution Damage¹¹⁷, concluded in Brussels in 1969. Three additional protocols were adopted later. International fund was established by International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage¹¹⁸, concluded in Brussels in 1971 and replaced by the another one in the 1992.¹¹⁹ The latter increased the liability and compensation limits. It represented satisfactory regime for oil pollution liability.

The Oil Pollution Liability Convention and Fund Protocol established liability of ship's owner for pollution damage caused by oil escaping from the ship as a result of an accident on the territory of one of the parties (including its territorial sea) and covered preventive measures to minimize such damage. Pollution damage is defined as a 'loss or damage caused outside of ship by contamination resulting from escape or discharge of oil from the ship.¹²⁰ Preventive measures mean any reasonable measures taken after the occurrence of the incident to prevent or mitigate pollution damage.¹²¹ Convention imposes on ship's owner strict and limited liability for oil pollution damage. Limitation is calculated by tonnage of the transported oil. The owner must set up a fund for a total sum that represents the limit of his liability. He can do it by depositing a sum or by producing guarantee. The difference from the nuclear conventions funds is that in nuclear conventions the contribution comes from the states, and in the International Oil Pollution Compensation Fund contribution comes from the impositions of oil companies, mostly the oil companies whose cargo the ship is carrying. Fund can be relieved of liability where the pollution damage is the result of war, hostilities, civil war or insurrection or where the oil is discharged from a warship or government-owned ship entitled to immunity.¹²² Marc Cogen notes that by creating this kind of liability regime for the oil industry, states are avoiding the state responsibility as such ¹²³

¹¹⁵ Erika was a tanker that transported heavy fuel oil and sank in December 1999, 70 km off the French coast, spilling 20,000 tons of heavy fuel oil; Prestige was also a tanker that sank in 2002, spilling 70,000 tons of heavy fuel oil creating massive oil pollution in Spain

¹¹⁶ Louka (n.54) p. 451

¹¹⁷ Convention on Civil Liability for Oil Damage, November 29, 1969, UNTS 3, 9 ILM 45 (1970) (Oil Pollution Liability Convention)

¹¹⁸ Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971, Brussels, December 18, 1971, 1110 UNTS 57

¹¹⁹ Protocol to Amend the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, November 27, 1992

¹²⁰ Oil Pollution Liability Convention, art. 1 (6)

¹²¹ Ibid, art. 1 (7)

¹²² Ibid, art. 4 (2)

¹²³ Cogen (n. 114) p. 162

Regarding the prevention of pollution of marine environment, Article 10 of the Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter (London Convention)¹²⁴ regulates that:

contracting states should develop procedures for the assessments of liability and the settlement of disputes regarding the dumping, in accordance with the principles of international law regarding the State responsibility of damage to environment of other states or to any area of the environment caused by dumping of wastes.¹²⁵

3.3. Regimes for accidents caused by hazardous waste

3.3.1 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)

Before the adoption of Convention, there were many cases of illegal dumping of hazardous wastes mostly in Africa and other developing countries. In the recent past, developed countries tried to avoid the high costs of disposal in their counties by shipping hazardous wastes to the developing countries. Industrialized countries are the biggest producers of equipment which later becomes hazardous waste. The importance of the transboundary movement of hazardous waste is the fact that it is related to the public health and environmental protection.

In 1989, in order to protect those developing countries, the United Nations prepared Basel Convention of Transboundary Movements of Hazardous Wastes and their Disposal¹²⁶, which entered into force in the 1992. Today it is a global convention with 175 state parties, although the United States is not yet a state party. The main aim of Basel Convention is the protection of human health and the environment against the adverse effects of hazardous wastes. It should be noted that according to the Basel Convention, transboundary movement is not prohibited just restricted, with special emphasis on disposal of waste 'in an environmentally sound manner'¹²⁷ and with a prior consent of importing state. Lately, states have focused on reducing the generation of waste through cleaner industrial processes, changes in lifestyles, improvement of waste treatment, control of international movement of waste.

The Basel Convention defines waste as 'substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law.' But the problem is that the definition of waste may differ from one state to another. The Convention also requires that Parties inform the other Parties, through the Secretariat of their national definitions.¹²⁸

Convention of Parties brought Guidelines for environmentally sound management of specific kind of waste. On the third meeting of Convention of Parties held from 18 to 22 September

¹²⁴ Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, December 29, 1972,

¹⁰⁴⁶ UNTS 120 (London Convention)

¹²⁵ London Convention, art. 10

¹²⁶ Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, March 22, 1989, 28 ILM 649 (1989) (Basel Convention)

¹²⁷ Hanqin (n. 37) p. 69

¹²⁸ Basel Convention, art. 2(1), 3

1995 in Geneva, they adopted an Amendment to the Convention, known as 'Basel Ban'. The Amendment tried to prohibit all forms of hazardous waste exports from the 29 wealthiest and most industrialized countries of the Organization of Economic Cooperation and Development (OECD) to all non-OECD countries. Unfortunately, 'Basel Ban' never entered into force, mostly because of the industrialized countries, that are against it. Thus, it is not binding upon the other states. Xue Hanqin gives an example of the first binding agreement that bans transboundary movements of hazardous and nuclear waste. It is the Lomé Convention¹²⁹ between Member States of the European Union and developing ACP¹³⁰ countries. The other example is the Bamako Convention¹³¹ that bans 'dumping of hazardous wastes including incineration at sea and disposal in the seabed and subseabed.'¹³² Bamako Convention was adopted because of the discontent of African states with the Basel Convention and failure to ban transboundary movements of hazardous wastes to developing countries.

3.3.2. Protocol on Liability and Compensation for Damage resulting from Transboundary Movement of Hazardous Wastes and their Disposal (1999)

On the fifth Conference of the Parties in 1999, the Protocol On Liability and Compensation the Protocol to the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal¹³³ was adopted.

The Protocol recognizes and establishes the regime of liability and compensation of damage occurring during the movement of hazardous waste (including the damage caused by illegal traffic) from the point where the wastes are loaded on the means of transport in an area under the national jurisdiction of the state of export.¹³⁴

The Protocol imposes two types of liability: strict liability and fault based liability. The rule for the first type of the liability is prescribed by Article 4, the person who has the obligation of notification is liable for damage until the disposer has taken possession of the hazardous wastes and other wastes. After that, the disposer is liable for damage. If the State of export is the notifier or if no notification has taken place, the exporter shall be liable for damage until the disposer has taken possession of the hazardous wastes and other wastes. Once again, after that disposer is liable for damage.¹³⁵

The strict liable person is liable to the certain limit. If a person can prove that damage occurred as a result of an act of armed conflict, hostilities, civil war or insurrection, result of a natural phenomenon of exceptional, inevitable, unforeseeable and irresistible character, no liability will be applied. ¹³⁶Secondly, according to Article 5 of the Protocol, the fault based liability means that any person shall be liable for damage caused or contributed to by his lack of compliance with

¹²⁹ African, Caribbean and Pacific States-European Economic Community: Forth Lomé Convention, December 15, 1989, 29 ILM 783(1989)

¹³⁰ African, Caribbean and Pacific Group of States

¹³¹ Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa, January 29, 1991, 30 ILM 775 (1991)

¹³² Hanqin (n. 37) p. 66

¹³³ Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Waste and their Disposal, December 10, 1999 (Protocol)

¹³⁴ Protocol, art. 3 (1)

¹³⁵ Ibid, art. 4 (1)

¹³⁶ Ibid, art. 4 (5)

the provisions implementing the Convention or by his wrongful intentional, reckless or negligent acts or omissions.¹³⁷

So, there are three possible payers for damage caused by accident: the operator or his insurance, then the fund if operator's insurance doesn't cover the amount that has to pay and the state. The latter arises if those two previously mentioned are not covering the compensation. The first two will have strict liability and the state will have state responsibility for a wrongful acts. This system is '*sine delicto*' liability of the operator for payment and compensation for damage and goes together with state responsibility for wrongful acts. The trouble will be for the victim to prove the fault as well as the breach by state of its obligations arising from the Basel Convention and also that the damage occurred because the state did not fulfil its obligations. Therefore, states imposed in their national laws no-fault liability on operators. Moreover, states imposed also the compulsory insurance to cover liability.¹³⁸

Some problems may occur regarding the developing countries. The Secretariat of the Basel Convention may, upon request, assist a party to the convention which is a developing country or a country with economy in transition in case of an incident occurring during a transboundary movement of hazardous wastes and other wastes and their disposal, including illegal traffic. In such case, the Secretariat of the Basel Convention will financially help them through the Technical Cooperation Fund.¹³⁹

3.3.3. The growing problem of the e-waste

New technologies have become the necessity in modern society. We are surrounded by the electrical and electronic equipment which will certainly one day become part of the hazardous waste. Compounded of hazardous substances like, for example, lead, mercury, PCB¹⁴⁰, asbestos and CFC's¹⁴¹ that can cause risks to human health and the environment when improperly disposed of or recycled. Therefore specific attention should be put on their environmentally sound waste management. Many of those materials can be re-used or recycled and it 'can lead to conservation of energy and reduction in greenhouse gas emissions when adequate technologies and methods are applied.'¹⁴²

E-waste is defined as 'electrical and electronic equipment that is no longer suitable for use or that the last owner has discarded with the view of its disposal, for example final disposal, recovery or recycling.' Even though, the Basel Convention has identified e-waste as hazardous and made a framework for controls on transboundary movement of such waste, developed countries still export e-waste to developing countries for re-use, repair or recovery of materials. Unfortunately, the

¹³⁷ Ibid, art. 5

¹³⁸ Barboza (n.44) p. 234

¹³⁹ Interim Guidelines for the Implementation of Decision V/23 'Enlargement of the Scope of the Technical Cooperation Trust Fund http://www.basel.int/meetings/interguide00.html accessed April 1, 2011

¹⁴⁰ Polychlorinated biphenyls are toxical compounds. Their destruction by chemical, thermal, and biochemical processes is extremely difficult, and presents the risk of generating extremely toxic substances through partial oxidation ¹⁴¹ Chlorofluorocarbon is an organic compound that contains carbon, chlorine and fluorine. CFCs in existing products such as refrigerators, air conditioners, aerosol cans and others, posing a threat to both the ozone layer and the climate

¹⁴² Draft technical guidelines on transboundary movements of used electronic and electrical equipment and e-waste, in particular regarding the distinction between waste and non-waste under the Basel Convention (draft for consultation, version 21 February 2011) < www.basel.int/techmatters/e_wastes/guidelines/guidelines/2011-02-25.doc >accessed March 16, 2011 (Draft Technical Guidelines)

reality is that this export very often happens to avoid costs of more careful environmentally sound management in their own countries by allowing the waste management to take place in weaker economies that 'are not likely to possess the infrastructure and societal safety nets to prevent harm to human health and the environment.'¹⁴³

According to the report of the Basel Action Network¹⁴⁴ 50 – 80% of the e-waste is exported from industrialized countries, mostly to China and other East Asian countries for cheap recycling and final disposal or residues due to the low labour costs and less stringent environmental regulations in this region. Residents of these countries are on the constant influence of poison. Moreover, teenagers are exploited for most of these jobs, even children, which dump the collected parts without any protection or knowledge about the consequences for their health. Those devices are sent under the excuse that they are only used and still usable. The fact is that they are usually completely useless.¹⁴⁵

Possible contribution to sustainable development could be direct re-use or re-use after repair or refurbishment. Re-use extends the lifetime of the equipment and provides for access to such equipment for groups in society that otherwise would not have access to it. However, re-use can also have negative impacts if not done properly. The lack of clarity in defining when used equipment is waste and when not has led to a number of situations where such equipment was exported to, in particular, developing countries for re-use where a large percentage of these goods in fact were not suitable for further use and had to be disposed of in the developing country as waste. Because of the 'frequent presence of hazardous substances and components in this equipment and the lack of adequate installations to treat those in an environmentally sound manner this has led to serious problems for human health and the environment in the countries receiving this e-waste.'¹⁴⁶

The novelty in waste management is the Extended Producer Responsibility approach. It is defined as an environmental policy in which producer's responsibility is extended to the post consumer stage of the product's life cycle, including its final disposal.¹⁴⁷ Rolf Widmar and others are describing situation in article 'Global perspectives on e-waste':

Keeping in line with the polluter pays principle, an Extended Producers Responsibility policy is characterised by the shifting of responsibility away from the municipalities to include the costs of treatment and disposal into the price of the product, reflecting the environmental impacts of the product. Legislators are increasingly adopting EPR policies to manage various kinds of wastes, such as discarded cars, electrical and electronic appliances and batteries, which require special handling and treatment.¹⁴⁸

The fact that the used products will come back to companies that produce equipments will force the companies to produce components less dangerous materials and to use the materials that can be reused or recycled. Producers will therefore invest more in development of those kinds of materials

http://www.oecd.org/document/19/0,3746,en_2649_34281_35158227_1_1_1_1,00.html accessed March 1, 2011 ¹⁴⁸ Rolf Widmar, Heidi Oswald-Krapf, Deepali Sinha-Khetriwal, Max Schnellmann, Heinz Böni, 'Global perspectives on e-waste' (2005) Environmental Impact Assessment Review 25, p. 446

¹⁴³ Draft Technical Guidelines

¹⁴⁴ Basel Action Network is the world's only organization focused on confronting the global environmental injustice and economic inefficiency of toxic trade (toxic wastes, products and technologies) and its devastating impacts http://www.ban.org/main/about_BAN.html accessed February 8, 2011

¹⁴⁵ Draft Technical Guidelines

¹⁴⁶ Ibid

¹⁴⁷ 'Extended Producer Responsibility'(OECD)

and ensure the environmentally sound disposal. By doing this, it will in the end benefit the environment as such.

3.4. International liability and redress according to Convention on Biological Diversity

According to Article 1 of the Convention on Biological Diversity states are obliged to conserve their own biodiversity. Under Article 3 it is prescribed that states must ensure that activities within their jurisdiction or control do not cause any damage to the biodiversity of other state. Catherine Tinker states that Article 3 of the Convention:

offers a basis for asserting the state responsibility. Although the duty applies only to extraterritorial harm, the Convention's article on jurisdictional scope may give a rise to responsibility for a state's activities, regardless of where the effect occurs.¹⁴⁹

However, the Convention on Biological Diversity does not cover the issue of liability and redress. There has been need to develop and establish 'effective rules governing liability and redress for environmental harm and diminution in biological diversity.'¹⁵⁰

Article 14 paragraph 2 of the Convention of Biological Diversity provides:

The Conference of the Parties shall examine, on the basis of studies to be carried out, the issue of liability and redress, including restoration and compensation, for damage to biological diversity, except where such liability is a purely internal matter.¹⁵¹

Preamble of the Convention of Biodiversity notes that the 'conservation of biodiversity is a 'common concern of human kind', therefore it is not clear why the liability and redress are still issues of internal matter. Some of possible transboundary effects of the loss of biological diversity are certainly a matter of international concern.

Michael Bowman emphasises that for many legal systems the question of compensation for general environmental harm still makes difficulties. Therefore, the environmental harm in relation with biodiversity loss must be explored 'more fully in order to assess the feasibility of development new regimes of reparation'. He notes that values of biodiversity are important for economic analysis and states that 'it should be possible to calculate how much interested individuals would be prepared to pay for its continued preservation.' While the environmental economist ensure that the 'environmental degradation are internalized and allocated to those responsible', the 'delictual responsibility' and 'calculation of damages' still exists as an actual problem.¹⁵²

The problem for economic calculation is the measurement of the intrinsic values. According to Pearce and Moran 'intrinsic values are relevant to conservation decisions, but they are generally

¹⁴⁹ Catherine Tucker, 'Responsibility for Biological Diversity Conservation Under International Law' (1995) Volume 28, VJTL p. 881

¹⁵⁰ Michael Bowman, 'Biodiversity, Intrinsic Value, and Definition and Valuation of Environmental Harm' in Michael Bowman and Alan Boyle (eds), *Environmental Damage in International and Comparative Law* (Oxford University Press, 2002) p. 41

¹⁵¹ The Convention on Biological Diversity 1992 < http://www.cbd.int/convention/text/> accessed February 12, 2011 ¹⁵² Bowman (n.150) p. 44

not measurable.' ¹⁵³ On the other hand, Bowman thinks that 'there is now substantial body of scientific literature on the question of assessing and restoring damage of ecosystems.¹⁵⁴ The cost of some types of restoration can be measured in the sense of determining the compensation. When the restoration is not possible, 'techniques for assessing ecological harm' could show the 'the scale of the damage done.³¹⁵⁵ Biodiversity beside this economic value has the aesthetic, ethical, ecological and scientific values.

The central role in controlling the implementation of the Convention has the Conference of the Parties, which is responsible for modifications to the Convention, drafting and adopting additional Protocols with more precise obligations for the parties. After the fifth meeting, the Conference of the Parties requested the Executive Secretary to collect and compile 'technical information relating to damage to biological diversity and approaches to valuation and restoration of damage to biological diversity as well as information on national measures and experience'. For that purpose technical expert group was formed to assist the Conference of Parties. Technical expert group consists of experts nominated by the governments, observers from relevant international organisations non-governmental organisation and convention secretariats. The task of this group is to examine information gathered by Executive Secretary and to make analysis regarding the liability and redress. Precisely their duty is to:

Clarify basic concepts and developing definitions relevant to paragraph 2 of (a) Article 14;

Propose the possible introduction of elements, as appropriate, to address specifically (b) liability and redress relating to damage to biological diversity into existing liability and redress regimes:

Examine the appropriateness of a liability and redress regime under the Convention (c) on Biological Diversity, as well as exploring issues relating to restoration and compensation;

(d) Analyse activities and situations that contribute to damage to biological diversity, including situations of potential concern; and

Consider preventive measures on the basis of the responsibility recognized under (e) Article 3 of the Convention.¹⁵⁶

Moreover, Conference of Parties requested the Executive Secretary to 'undertake further analysis relating to the coverage of existing international regimes regarding damage to biological diversity, activities or situations causing damage, including situations of potential concern and whether they can be effectively addressed by means of a liability and redress regime.¹⁵⁷ In further work, they identified concepts that are important for Paragraph 2 of Article 14 that need to be clarified. Those concepts are: state responsibility, liability, biological diversity, threshold, restoration, compensation, valuation of damage and phrase 'pure internal matter'. Since the Convention deals with the transboundary damage to biological diversity, the phrase 'purely internal matter' needs to be more clarified. It means that when there is no transboundary effect the issue will

¹⁵³ David Pearce and Dominic Moran, 'The economic value of biodiversity'

http://www.cbd.int/doc/external/iucn/iucn-biodiversity-value-1994-en.pdf> accessed February 21, 2011 ¹⁵⁴ Bowman (n.150) p. 58

¹⁵⁵ Ibid, p.58

¹⁵⁶ Liability and Redress in the context of Paragraph 2 of Article 14 of Convention on Biological Diversity: An analysis of Pertinent Issue, UNEP/CBD/EG-L&R1/2/Rev1, August 9, 2005, <http://www.cbd.int/doc/?mtg=EGLR-01> accessed March 16, 2011

¹⁵⁷ Ibid

be dealt on the basis of domestic law. On the other hand, some experts argued this phrase interpretation. They claimed that since biological diversity is a 'common concern of mankind' damage to biological diversity could not be defined as 'a purely internal matter.¹⁵⁸ Experts agreed that since International Law Commission already adopted draft principles with general application to activities that are not prohibited by internatonal law, focus in the framework of Biodiversity Convention should be on damage on biological diversity rather than activities.¹⁵⁹

Submitted reports of state parties have shown that most national legal regimes include liability and redress of the environmental damage, but they don't focus specifically on biodiversity damage.¹⁶⁰ The focus is now on strengthening capacities at the national level regarding to 'measures for the prevention of damage to biological diversity, establishment and implementation of national legislative regimes, and policy and administrative measures on liability and redress, and to provide financial resources for this purpose.' 161

The Conference of the Parties defined 'biodiversity loss' as 'the long-term or permanent qualitative or quantitative reduction in components of biodiversity and their potential to provide goods and services, to be measured at global, regional and national levels'. The elements of the definition are practical in a liability and redress context. For example, liability and redress rules for biodiversity might usefully refer to a measurable, qualitative or quantitative reduction in components of biodiversity.¹⁶²

Synthesis report by Conference of Parties indicated that liability and redress rules might also address not only the physical loss of components of biodiversity, but the loss of their ability to provide actual or potential goods and services. Therefore, a link can be establish to 'ecosystem' structure and function, ecological and economic contributions of ecosystems to environmental quality and human well being.' This would be a main consideration in any assessment of damage and consequent determinations needed to establish primary, complementary and compensatory measures to redress damage to biodiversity and the subsequent attachment of liability. Consequently, 'a definition of damage to biodiversity could usefully include an element addressing the duration of damage, reflecting that duration of loss needs to be of an enduring nature.¹⁶³

At this moment, Conference of Parties is still evaluating and collecting the information about the existing national liability and redress legal regimes for biodiversity damage. As we have seen many international agreements cover the activities that may cause environmental damage (nuclear damage, oil pollution damage and transboundary movement of waste). On the other hand no one of them mention damage to biological diversity. In any case, it should be done more urgent because of the threat to biodiversity loss is becoming more serious. Since the target to reduce the

¹⁵⁸ Ibid

¹⁵⁹ Report of the Group of Legal and Technical Experts on Liability and Redress in the context of Paragraph 2 Article 14 of the Convention on Biological Diversity, UNEP/COP/8/27/Add 3, (CBD, October 18, 2005)

<http://www.cbd.int/doc/meetings/cop/cop-08/official/cop-08-27-add3-en.pdf >accessed April 30, 2011

¹⁶⁰ Summary of submission by parties received by Executive Secretary on liability and redress, UNEP/CBD/EG-L&R/INF/3 (2005), (CBD, September 2, 2005) < http://www.cbd.int/doc/meetings/lr/eglr-01/information/eglr-01-inf-03-en.pdf> accessed March 15, 2011

¹⁶¹ Impact Assessment, Liability and Redress, Decision V/18 adopted in 5th meeting of Conference of Parties, UNEP/CBD/COP/5/23, http://www.cbd.int/doc/?meeting=cop-05> accessed on March 1, 2011

¹⁶² Synthesis report on technical information relating to damage to biological diversity and approaches to valuation and restoration of damage to biological diversity, as well as information on national/domestic measures and experiences, Conference of the Parties to the Convention on Biological Diversity, UNEP/CBD COP/9/20/A(2008) (CBD, March 20, 2011) < http://www.cbd.int/doc/meetings/cop/cop-09/official/cop-09-20-add1-en.pdf> accessed on March 1, 2011 ¹⁶³ Ibid. p. 3

biodiversity loss by the year 2010 has failed, this issue really need more expeditious approach and it is not sufficient to be done only at the national level. As already pointed out, damage to biological diversity is not internal matter of each state party.

4. EUROPEAN LIABILITY REGIME

4.1. Convention on Civil Liability for Damages Resulting from Activities Dangerous to the Environment (Lugano Convention, 1993)

The Lugano Convention was adopted by the Council of Europe in 1993.¹⁶⁴ It is a regional international agreement, with its overall objective and purpose to offer adequate compensation for damage to the environment that can result from dangerous activities and substances and to provide for means of prevention and reinstatement.¹⁶⁵ Article 2 provides rather wide definition of dangerous activities conducted professionally or by public authorities. Those activities are: the production, handling, storage, use or discharge of one or more dangerous substances or any operation of a similar nature dealing with such substances; the production, culturing, handling, storage, use, destruction, disposal of release or any other operation dealing with genetically modified organisms and other micro-organisms; the operation of an installation or site for the incineration, treatment, handling or recycling of waste; the operation of a site for the permanent deposit of waste.¹⁶⁶ It establishes strict liability regime, as it holds an operator of dangerous activities liable for incidents that cause damage. An incident under the Lugano Convention is defined as any sudden occurrence, or continuous occurrence, or any series of occurrences having the same origin that cause the damage or create grave and imminent threat causing damage.¹⁶⁷ However, The Lugano Convention does not include the transportation of dangerous substances or goods. Moreover, it should be stressed that the Convention also includes the definition of measures of reinstatement, which is important for restoration of the environment to the state as it was before damage:

Measures of reinstatement' means any reasonable measures aiming to reinstate or restore damaged or destroyed components of the environment, or to introduce, where reasonable, the equivalent of these components into the environment. Internal law may indicate who will be entitled to take such measures.¹⁶⁸

According to the mentioned definition, operator is 'liable for cost of reinstatement of destroyed components, or by introducing their equivalent into that environment.'¹⁶⁹ Not only the obligation for removal of hazardous substances, 'but also positive measures must be taken to restore the environment to its original condition.'¹⁷⁰ Furthermore, the Explanatory Report of the Convention clarifies that if a certain species of plants or animal 'has been rendered extinct by the incident, the same species have to be introduced to area when the cleaning is completed.¹⁷¹

¹⁶⁴ Convention on Civil Liability for Damage resulting from Activities Dangerous to the Evironment, June 21, 1993, 32 ILM 480 (Lugano Convention)

¹⁶⁵ Lugano Convention, art. 1

¹⁶⁶ Ibid, art. 2

¹⁶⁷ Ibid, art 2 (11)

¹⁶⁸ Ibid, art. 2 (8)

 ¹⁶⁹ Louise Angelique de la Fayette, 'International liability for damage to the environment' in Malgosia Fitzmaurice,
David Ong, Panos Merkouris, *Research Handbook of International Environmental Law* (Edward Elgar Pub., 2010) p.
340

¹⁷⁰ Ibid,p. 340

¹⁷¹ Ibid, p.340

Elli Louka argues that Lugano Convention was too ambitious in attempt to set up a liability regime for all dangerous activities that have impact on environment. For instance, the problem of general liability regime would be pollution. Pollution is, for example, a legal activity authorized by states. Most states today do not ban pollution. Instead, they try to regulate it. Because tolerance for pollution vary from state to state, it is difficult to establish a general liability regime for the impact of dangerous activities on the environment.¹⁷²

Lugano Convention provided for establishment of compulsory financial security to cover operator liability. Though, each state may implement it at national level, the Convention did not establish the obligation for environmental liability at international level. Unfortunately, only nine states signed the Lugano Convention and no state has ratified it yet. However, it served as a model for European Union's liability regime and making of European Environmental Liability Directive.

4.2. Brief history of protection of the environment in the European Union

Environmental policy in the European Union is one of the most important areas in the European Union legislation. The Rome Treaty (1958)¹⁷³ did not include provisions that directly concerned the environmental protection. Under the influence of the Stockholm Conference in 1972. the first European Environmental Plan was adopted in 1973. The Single European Act¹⁷⁴ in 1986 gave the direct legal basis for environmental protection in the European Union by introducing the principal that environmental protection should be considered in future legislation. EU environmental policy was expanded by the Maastricht Treaty on European Union in 1992.¹⁷⁵ According to Article 130 r the action of the Union in environmental matters shall be based on four principles: 'precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay. Environmental protection requirements must be integrated into the definition and implementation of other Community policies.¹⁷⁶ Objectives of the Maastricht Treaty are preserving, protecting and improving the quality of the environment, protecting human health, rational utilization of natural resources and promoting measures at international level to deal with regional or worldwide environmental problems.¹⁷⁷ The Lisbon Treaty ¹⁷⁸ made sustainable development a key objective for the EU and, in 2010, the EU changed environmental Directives to make sure that they comply with the Lisbon Treaty.¹⁷⁹

¹⁷² Eli Louka, International Environmental Law: Fairness, Effectiveness and World Order (Cambridge University Press, 2006) p. 467

¹⁷³ Treaty Establishing the European Community, March 25, 1957 (Treaty of Rome)

¹⁷⁴ Single European Act, February 17, 1986

¹⁷⁵ Treaty Establishing the European Union of July 29, 1992 (1992) OJ C 191, (Maastricht Treaty) art. 130 r (2)

¹⁷⁶ Maastricht Treaty, art. 130 r (2)

¹⁷⁷ Maastricht Treaty, art. 130 r (1)

¹⁷⁸ Consolidated versions of the Treaty on European Union and the Treaty on the Functioning of the European Union of OJ C 115 (Lisbon Treaty)

¹⁷⁹ 'Environmental Policy', (Institute for Studies in Civil Society)

<http://www.civitas.org.uk/eufacts/FSENV/ENV1.html> accessed April 1, 2011

4.3. Directive 2004/35/EC on environmental liability with regard to the prevention and remedying of environmental damage (European Environmental Liability Directive)

The European Commission first proposed a Directive on civil liability for environmental damage in 1989, which was a response to disasters causing a huge damage needing extensive remediation. These disasters left individual States with the responsibility to cover the costs of clean up. In 2002, a new proposed Directive of environmental liability was published.

The Council adopted Directive 2004/35 on Environmental Damage with Regard to the Prevention and Remedying of Environmental Damage (Directive).¹⁸⁰ The Directive entered into force on April 30, 2004, with time limit for implementation by Member States till the April 30, 2007.

It establishes a framework of environmental liability based on the polluter-pays principle¹⁸¹. to prevent and remedy environmental damage. The basic idea for introducing the polluter-pays principle is that a liable person shall bear costs of compensation rather than society as a whole bear those costs, meaning particularly the tax payers. All the Member States in the European Union have national civil liability regime that cover damage to a person or property, but in case of wider environmental damage, if not properly regulated, society will bear cost. It was unacceptable. According to the polluter pays principle, the one that causes pollution is 'liable for pollution damage regardless of culpa, and also for the costs for preventing such damage.¹⁸² Reasoning of this principle is that the polluters benefit from the polluting activities and pollution is normal effect of this activity. The expectation was that this would result in better prevention and precaution. Moreover, the Directive also holds liability for the preventive actions. This will increase the complete environmental protection all over the European Union.

The Directive deals with two liability regimes. The first one is strict liability (objective liability) and it applies to operators who professionally do risky or potentially risky activities. These activities include industrial and agricultural activities, waste management operations, the release of pollutants into water or into the air, the production, storage, use and release of dangerous chemicals, and the transport, use and release of genetically modified organisms.¹⁸³ Annex III of the Directive specifically lists those activities. Under this liability regime, an operator can be held liable even if he has not committed any fault, but there is an exemption from liability in few cases. The second liability regime is fault based liability (subjective liability) and it applies to all professional activities, including those not listed in Annex III, but an operator will only be held liable if he was

¹⁸⁰ Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on Environmental Liability with Regard to the Prevention and Remedying of Environmental Damage (2004) OJ L 143 (Directive)

¹⁸¹ Polluter pay principle was first mentioned at international level in 1972, when the Member States of the Organization of Economic Cooperation and Development (OECD) have agreed that they will not subsidize the cost of measures to prevent and control pollution and that these costs should be paid by those who cause pollution.

See Recomendation on Guiding Principles Concerning International Economic Aspects of Environmental Policies, C (72) 128, OECD, 1972; Recomendation on the Implementation on the Polluter Pays Pronciple, C (74) 223, OECD, 1944; Rio Declaration reaffirms this principle, Principle 16.

¹⁸² Jonas Ebbeson and Phoebe Okowa, Environmental Law and Justice in Context (Cambridge University Press, 2009) p. 420 ¹⁸³ FAQ on European Environmental Liability Directive, (IHS, April 27, 2007) < http://www.ihs.com/news/eu-en-

polluters-pay-faq-4-07.htm> accessed April 30, 2011

at fault or negligent and if he has caused damage to species and natural habitats protected at the EU level under the 1992 Habitats¹⁸⁴ and the 1979 Birds¹⁸⁵ Directives.

The idea was also to engage non-governmental organizations and civil society in protecting environment and entitle them to submit to the competent authority any observations relating to environmental damage or a possible threat of such damage of which they are aware and also submission of request to the competent authority to take action. Public interest groups, such as nongovernmental organisations are able to require public authorities to act, if this is necessary, and to challenge their decisions before courts, if those decisions are deemed illegal. This offers an additional safeguard. 186

Regarding the liability, public authorities will play an important role. Their duty will be to identify liable polluters and ensure that these finance the necessary preventive or remedial measures. In case when polluter cannot be identified, or is insolvent and cannot pay for the reparation of damage, the Directive suggests that Member States foresee the option of 'safety nets' in order to pay for restoration. Member States are left to decide for themselves how such 'safety nets' are financed, which could clearly lead to an additional burden on tax-payers.¹⁸⁷

The Directive does not require Member States to remedy environmental damage, if the polluter cannot be identified or is insolvent. The competent authorities will decide whether this socalled 'orphan damage' is to be remedied or not. Of course, if the state itself or a state-owned body is the polluter, the state will have to pay, like any other polluter.¹⁸⁸ There should be subsidiary state responsibility under the Directive to ensure that if no operator can be found, the competent authority must be obliged to restore the damage. That might cause more commitment with higher environmental standards in the Member States. In critical overview of the Directive, this issue is pointed out as a drawback of the Directive. The example for the orphan damage would be climate change caused, among others, by emission of 'man-made gasses'. Unfortunately, no operator can be identified as 'causative'. Drawback is that in situation described above no administrative agency is liable to take remedial measures.¹⁸⁹ States are not yet ready to take that kind of responsibility.

The Directive deals with prevention and remedying of damage, and defines damage in Article 2 as 'a measurable impairment of a natural resource service which may occur directly or indirectly.¹⁹⁰ Damage to the person or property is explicitly excluded from the scope of the application of the Directive. Furthermore, the Article 3 Paragraph 3 states that the Directive doesn't give the right of compensation to private parties for damage resulting from environmental harm. National rules of civil liability will cover that kind of damage. According to Article 2 paragraph 1 the environmental damage consists of three types of damages:

(a) damage to protected species and natural habitats, which is any damage that has

significant adverse effects on reaching or maintaining the favourable conservation status of

¹⁸⁴ Council Directive 92/43/EEC of 21 May 1992 on the Conservation of natural habitats and of wild fauna and flora (1992) OJ L 206

¹⁸⁵ Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (1979) OJ L 103

¹⁸⁶ Directive, art 12 (1)

¹⁸⁷ FAQ on European Environmental Liability Directive, (IHS, April 27, 2007) < http://www.ihs.com/news/eu-enpolluters-pay-faq-4-07.htm> accessed April 30, 2011 ¹⁸⁸ Ibid

¹⁸⁹ Gerd Winter, Jan H. Jans, Richard Macrory and Ludwig Krämer, 'Weighing up the EC Environmental Liability Directive' (2008) JEL, Volume 20, Issue 2, p. 10

¹⁹⁰ Directive, art 2 (2)
such habitats or species. The significance of such effects is to be assessed with reference to the baseline condition, taking account of the criteria set out in Annex I;

(b) water damage, which is any damage that significantly adversely affects the ecological, chemical and/or quantitative status and/or ecological potential;

(c) land damage, which is any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction, in, on or under land, of substances, preparations, organisms or micro-organisms.¹⁹¹

'The Directive's most significant innovation is that liability is extended to environmental damage as such. In contrast to most civil liability schemes, liability is not dependent on whether the environmental good belongs to someone's property.'¹⁹² Since the Directive deals only with damage to the wider environment, all three types of damages, mentioned above, need to have significant adverse effect. Therefore, each state must designate the competent authorities to deal with the prevention and remediation of environmental damage.¹⁹³ In case that risk of the harm or harm occurs, then the competent body have to check if the damage is significant and also to determine which remedial measures should be taken. For that reason, the competent authority shall be entitled to require the relevant operator to do assessment and to provide any information and data necessary.¹⁹⁴

According to Article 16, Directive deals with prevention and restoration of contaminated sites and on loss of biodiversity. It is limited to the Natura 2000 protected areas. Directive provides minimum level of protection. This means that Directive entitles Member States to adopt stricter provisions in their national law.¹⁹⁵

Drawback of this Directive is that it has no retroactive effect. In other words, that it is not applicable to the damage that occurred before April 30, 2007 but only for future damages. Furthermore, 'Directive is subsidiary to international law and it applies only on certain types of damages.'¹⁹⁶ Nuclear damages and oil pollution damages are excluded, because both are covered by international treaties, mentioned before.

The European Union has the attributed competence, which means that the Union can act in the areas so far as the competence has been conferred to it by the Member States. Competences that are not conferred remain within the Member States. According to the Article 4 of the Treaty of the Functioning of European Union, the environment is a shared competence between the European Union and the Member States. The Member States had time limit for implementation of Directive till the April 30, 2007. In case that Member States don't implement Directive on time or it was implemented wrongly, provisions of Directive can be directly applicable before national courts. Moreover, provision can be used for interpretation of national laws to make sure that national law in conformity with Directive. In case of non-compliance of national law with Directive, Member State can be liable to pay compensation. According to case law settled by the Court of Justice of the

¹⁹¹ Directive, art 2 (1)

¹⁹² Gerd Winter, Jan H. Jans, Richard Macrory and Ludwig Krämer, 'Weighing up the EC Environmental Liability Directive' (2008) JEL, Volume 20, Issue 2, p. 5

¹⁹³ Directive, art. 11 (1)

¹⁹⁴ Ibid, art. 11 (2)

¹⁹⁵ Ibid, art. 16

¹⁹⁶ Monika Hinteregger, *Environmental Liability and Ecological Damage in European Law*, (Cambridge University Press, 2008), p. 640

European Union, namely, Frankovich case, there are three conditions for state liability. First, the rule of law infringed must be intended to confer rights on individuals. Then, the breach must be sufficiently serious and third, there must be a direct causal link between the breach of the obligation on the State and the loss or damage by the parties. Therefore, if the damage arises after time limit for the implementation and the directive's implementation would have prevented the damage, an individual might claim for compensation before the national courts of the Member State according to the conditions of state liability. Some authors argue that Member States would defend themselves by claiming that that Directive is not intended to protect individuals, but environment as such. Another problem would be proving causal link.¹⁹⁷ So far there has been no such case before the Court of Justice of European Union that would clarify this possible situation.

On the other hand, because of the supranational system of the European Union and transposition of a part of the Member State's sovereignty to the European institutions, the Commission may bring proceeding against a Member State which breached the European law. It is prescribed by Articles 258 and 260 of the Treaty of the Functioning of European Union as actions for failure to fulfill obligation and failure to comply with judgment. Thus, 'legal cause for the Member State's liability is not the occurrence of damage, but their breach with an obligation arising under European law. That liability 'arises out of the general agreement of the Member States to fulfill certain duties under European law.'¹⁹⁸

4.4. First cases of the Court of Justice of the European Union regarding the Environmental Liability Directive (Judgments in Case C-378/08 and Joined Cases C-379/08 and C-380/08)

The Court of Justice of the European Union brought its first ruling on the Environmental Liability Directive on March 9, 2010 in three cases (C-378/08¹⁹⁹ and joined cases C-379/08²⁰⁰ and C-380/08)²⁰¹ concerned the pollution of Sicilian land, groundwater and neighbouring sea by petrochemical plants. The Italian authorities designated the area to be a 'Site of National Interest for the purposes of decontamination' and started proceedings to require various petrochemical companies to clean up the contamination. The remedial measures imposed by the Italian authorities included the 'removal of contaminated sediment from the Augusta harbour to a depth of two meters, the construction of a hydraulic dyke to contain groundwater beneath the land, and the construction of a physical barrier along the shoreline adjacent to the operators' land.²⁰² Many different proceedings started before Italian national courts. Then the Tribunale amministrativo regionale della Sicilia (Regional Administrative Court) stopped the proceeding and referred several questions to the Court of Justice of the European Union for a preliminary ruling. Those questions were concerned the application of the polluter pays principle, set out in

¹⁹⁸ Rudinger Wolfrum, Christine Langenfeld, Petra Minnerop, 'Environmental Liability in International Law, Towards a Coherent Conception', Max Plank Institute for Comparative Public Law and International Law, November 2001

¹⁹⁷ Winter (n.192) p.29

< http://www.umweltdaten.de/publikationen/fpdf-k/k2942.pdf> accessed April 10, 2011

¹⁹⁹ C- 378/08 Raffinerie Mediterranee SpA V Ministro dello Sviluppo Economico and others (2010)

²⁰⁰ C- 379/08 Polimeri Europa SpA, Synidial SpA V Ministro dello Sviluppo Economico and others (2010)

²⁰¹ C-380/08 ENI SpA V Ministro dello Sviluppo Economico and others (2010)

²⁰² Fogelman Valerie, 'First Environmental Liability Directive cases from the European Court of Justice', (Commercial Risk Europe, June 4, 2010< http://www.commercialriskeurope.com/cre/190/57/First-Environmental-Liability-Directive-cases-from-European-Court-of-Justice/> accessed April, 30 2011

article 191 of the Lisbon Treaty, and the Directive. The Regional Administrative Court seek to find out whether the polluter pays principle precludes national legislation which allows the competent authority to impose measures for remedying environmental damage on operators 'on the ground of the fact that their installations are located close to a polluted area, without first carrying out an investigation into the occurrence of the contamination or establishing fault on the part of the operators or any causal link between those factors and the pollution found.²⁰³

The Court of Justice of the European Union in its judgment concluded that a Member State may establish a rebuttable presumption that a causal link exists between the contamination that must be remediated and the activities of one or more operators. It is important for a competent authority to apply the presumption, to investigate the origin of the contamination and have reasonable evidence that a causal link exists. Evidence may include the location of the operator's facility near the contamination and a correlation between substances used by the operator and those identified at the contaminated site. The competent authority has discretion regarding the procedures, criteria and length of the investigation. An operator may rebut the presumption by showing that its activities did not cause the contamination.

Furthermore, the European Court of Justice concluded that the polluter pays principle and the Directive do not preclude domestic law that requires a company that has not been at fault or negligent to remediate contamination. In this case, domestic Italian law applied to the remediation of contamination that preceded 30 April 2007 or otherwise did not fall under the Directive. The court also stated that the Directive applies to environmental damage caused by an emission, event or incident that took place after 30 April 2007 if the damage is derived from activities carried out after that date or activities that had been carried out but had not finished before that date. Moreover, Court decided that in cases of contamination such as the serious contamination in Sicily, the Directive does not preclude domestic legislation under which a competent authority may condition an operator's right to use its land on the operator remediating contamination on bordering land. The court also noted that the authority may do so even if the operator's land had never been contamination on its land had been remediated.²⁰⁵

²⁰³ 'Operators with instalations located close to a polluted area may be deemed to be liable for the pollution', (Court of Justice of the European Union, Press Release No. 25/10, March 9, 2010)

http://curia.europa.eu/jcms/upload/docs/application/pdf/2010-03/cp100025en.pdf accessed April 12, 2011 ²⁰⁴ Ibid

²⁰⁵ Ibid

5. CONCLUSION

The purpose of this paper has been to present the state responsibility and state liability in relation with the environmental damage. We have seen how the concept of state responsibility was developed through customary law and few cases of international tribunals and arbitration. The Work of International Law Commission had a major role in codifying the customary law of state responsibility. Forty years of International Law Commission's effort to codify customary law finished by producing the Draft Articles for Internationally Wrongful Acts in 2001. Two main conditions are needed for state responsibility. One is the breach of international obligation and another is the act that constitutes a breach must be attributable to the state. Unfortunately, invoking the state responsibility in field of environment still remains a problem. Due to the development and industrialisation, the number of hazardous activities increased and many of these activities are allowed by international law. However, state responsibility may arise only out of illegal acts. Today, there are many activities that are allowed by international law, but may cause catastrophic damage to the environment. The concept of state responsibility started to be insufficient and state liability has developed in the response to that lacuna.

It was pointed out that the state responsibility could be invoked only for internationally wrongful acts of state. Therefore, the International Law Commission stretched its work and produced Draft Articles and Principles on State responsibility and International Liability for Injurious Consequences Arising out of Acts not Prohibited by International Law. Environmental harm became a main focus of International Law Commission while they were drafting the Articles and Principles. For the purpose of prevention of the significant transboundary harm, states shall take all the appropriate measures to minimize the risk of harm. Moreover, states shall cooperate in preventing harm. One should keep in mind that the international co-operation plays important role in the protection of the environment, especially before the occurrence of the damage. Regarding the co-operation it should also be mentioned that Principle 24 of the Stockholm Declaration and Principle 7 of the Rio Declaration emphasize the importance of international co-operation concerning the protection and improvement of environment, states should cooperate in a spirit of global partnership. Therefore, many states concluded multilateral and bilateral international agreements that include the international co-operation. In spite of believing that the international cooperation was the key in preventing the environmental damages, the practice and number of cases have shown the opposite. The recent case of the nuclear accident in Japan has pointed out the flaws in existing legal instruments and that improvements are needed.

Furthermore, this paper has presented the relevant international conventions dealing with hazardous activities and regimes for transboundary environmental damage. In case that damage, in spite of all preventive measures taken, occurs, that is likely to occur, due to the hazardous activities. As we have seen, most of the convention cover the civil liability regime, as states do not want to accept the responsibility for acts of private operators. This paper tackled the regimes for nuclear damage, maritime damage and transboundary movement of hazardous waste. In those regimes supplementary funds are needed because states should be guarantor for compensation for environmental damage. Risky activities may cause ecological catastrophe and in those cases the operator alone is not able to cover all the costs. The International Law Commission has also dealt with this problem and included the solution in the Draft Principles Allocating of Loss Arising of Hazardous Activities. State must ensure that the compensation is paid to the victims of transboundary damage caused by hazardous activities on its territory. In other words, state must ensure the operator's liability and establish an additional fund.

Regarding the Convention of Biological Diversity, negotiations of a possible Protocol on liability and redress are still in the process. However, the damage to biological diversity is not the matter of internal rules. Until today, the Conference of Parties is still evaluating the gathered information on the existing national liability and redress regimes relating to biodiversity damage. It should be done in more expeditious way, because of the constant threat of biodiversity loss. This long process of dealing with the liability in this field shows that the states do not want to accept too much responsibility for this kind of damage.

At the European level, the regional Council of Europe's Convention on Civil Liability from Damages Resulting from Activities Dangerous to the Environment was presented. The Convention included rather broad scope of damage and never entered into force. On the other hand, at the European Union level, the European Environmental Liability Directive has shown that the states have obligation for preventing possible damage and remediating damage that has already occurred. Liability is also transmitted to the operator and the each Member State must designate competent public authority that will make a list of operators that perform dangerous activities. These operators will be liable for environmental damage and compensation will be paid according to the national law. In case that risk of the harm or harm occurs, then the competent authority has to check if the damage is significant and to determine which remedial measures should be taken. Therefore, the competent authority is entitled to require the operator to do assessment and to supply any information and data necessary.

In the recent rulings of the Court of Justice of the European Union regarding the European Environmental Liability Directive, it was concluded that that the Member States need to establish 'a weak causal link' between operator's activity and the pollution. In these cases competent authority may require operator to clean up the pollution. Within the European Union, the Court of Justice will have a major role in enforcing the environmental law. Moreover, Member States that breach the European law may be brought before the Court of Justice for failure to fulfil an obligation. The European Commission may start procedure against the Member State and it can end by imposing the lump sum or/and penalty payment. This means that at the European Union level, Member States transposed a part of their sovereignty to the European institutions. On the other hand, international agreements do not have that kind of enforcement mechanism. States cooperate voluntary and on basis on reciprocity. The sanction for the state parties that breach the international agreements could be suspension of rights and privileges, but it is not effective. In other words, the aim of environmental international agreements is to 'achieve global membership.'

6. **BIBLIOGRAPHY**

TABLE OF CASES

US v. Canada (Trail Smelter case), April 16, 1931, March 11, 1941, 3 UN Reports of International Arbitral Awards 1905 (1941)

United Kingdom v. Albania (Corfu Channel Case), April 9, 1949 ICJ Reports

Spain v. France (Lake Lannoux Arbitration Case), November 16, 1957, 12 UN Reports of International Arbitral Awards 281 (1957)

Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, July 8, 1996 ICJ Reports 226 (1996)

Hungary v. Slovakia (Gabčikovo-Nagymaros Project), September, 25, 1997 ICJ Reports 7(1997)

Germany v. Poland (Chorzow Factory case), December 16, 1927, Permanent Court of International Law (PCIL), Report Ser. A Nr. 7(1927)

Case C- 378/08 Raffinerie Mediterranee SpA V Ministro dello Sviluppo Economico and others (2010)

Case C- 379/08 Polimeri Europa SpA, Synidial SpA V Ministro dello Sviluppo Economico and others (2010)

Case C-380/08 ENI SpA V Ministro dello Sviluppo Economico and others (2010)

BOOKS

Al-Nauimi. N. and Meese R. (eds), *International legal Issues Arising under United Nations Decade* of International Law (The Hague, Nijhoff, 1995)

Aust A., Handbook of international law (Cambridge University Press, 2005)

Birnie P., Boyle A. and Redgwell C., *International Law and the Environment* (3rd edn,Oxford University Press, 2009)

Bowman M. and Boyle A.(eds), *Environmental Damage in International and Comparative Law* (Oxford University Press, 2002)

Brownlie I., Principles of public international law (7th edn, Oxford University Press, 2008)

Cogen M., The comprehensive guide to International law (die Keure, Brugge, 2008)

Crawford J., The international law commission's articles on state responsibility: introduction, text and commentaries (Cambridge University Press, 2002)

Ebbesson J. and Okowa P.(eds), *Environmental Law and Justice in Context*, (Cambridge University Press, 2009)

Fitzmaurice M. and Sarooshi D.(eds), *Issues of State Responsibility before International Judicial Institutions* (Hart Publishing, Oxford, 2004)

Fitzmaurice M., Ong D. and Merkouris P., *Research handbook on international environmental law* (Eduard Edgar Publisher, 2010)

Francioni F. And Scovazzi T.(eds), *International Responsibility for Environmental Harm* (London: Graham & Trotman Limited, 1991)

Hacket G.T., Space debris and the corpus iuris spatialis (Edition Frontieres, 1994)

Hanqin X., Transboundary Damage in International Law, (Cambridge University Press, 2003)

Hinteregger M., *Environmental Liability and Ecological Damage in European Law* (Cambridge University Press, 2008)

Horbach N.L.J.T., Liability versus responsibility under international law: defending strict state responsibility for transboundary damage (Leiden: s.n., 1996)

Kiss A. and Shelton D., International environmental law (2nd edn, Transnational Publisher, Inc, New York, 2004)

Lang W., Neuhold H. and Zamanek K. (eds), *Environmental Protection and International Law* (Graham& Trotman Limited, 1991)

Louka E., International environmental law: fairness, effectiveness, and world order (Cambridge: Cambridge university press, 2006)

Okowa P.N., *State Responsibility for Transboundary Air Pollution in International Law* (Oxford University Press, 2000)

Sands P., *Principles of International Environmental Law* (2nd edn, Cambridge University Press, 2003)

Sands P. and Galizzi P.(eds), *Documents in International Environmental Law*, (Cambridge University Press, 2004)

Shaw M.N., *International Law*, (6th edn, Camabridge University Press, 2008)

Smith Brian D., *State responsibility and the marine environment: the rules of decision* (Oxford: Clarendon press, 1988)

Stephens T., International Courts and Environmental Protection (Cambridge University Press, 2009)

Zamanek K, 'Responsibility of States: General Principle', in Rudolph Bernhardt *Encyclopedia of Public International Law* (Amsterdam : North-Holland, 1987)

Wenneras P., The Enforcement of EC Environmental (Law Oxford University Press, 2007)

JOURNALS

Boyle A., 'State Responsibility and International Liability for Injurious Consequences of Acts non Prohibited by International Law: A Necessary Distinction?' (1990) Cambridge Journals, Volume 39, Issue 1

Kiss A., 'State Responsiblitiy and Liability for Nuclear Damage', (2006), JIL, 35

Kiss A. and Shelton D., 'Strict Liability in International Environmental Law', GWU Legal Studies Research Paper No. 345

Scovazzi T., 'State Responsibility for Environmental Harm', YIEL (2001) Volume 12, Oxford University Press 2003

Tucker C., 'Responsibility for Biological Diversity Conservation Under International Law' (1995), VJTL, Volume 28

Starke G.J., 'Inputability in International Deliquences', British Yearbook on International Law, Nr. 19, Oxford University Press, 1938

Tol R.S.J. and Verheyen R., 'State responsibility for climate change damages-a legal and economic assessment' (2004) Energy Policy

Winter G., Jans J.H., Macrory R. and Krämer L., 'Weighing up the EC environmental Liability Directive' (2008) JEL, Volume 20, Issue 2

Widmar R., Oswald-Krapf H., Sinha-Khetriwal D., Schnellmann M., Böni H., 'Global perspectives on e-waste' (2005) EIA Review 25

LEGAL RESOURCES

Antarctic Treaty, December 1, 1959, 402 UNTS 71

Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa, January 29, 1991, 30 ILM 775 (1991)

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, March 22, 1989, 28 ILM 649 (1989)

Brussels Convention Supplementary to the 1960 Convention on Third Party Liability in the Field of Nuclear Energy, January 31, 1963, 1041 UNTS 358

Convention on Biological Diversity, June 5, 1982, 31 ILM 822 (1992)

Convention on Civil Liability for Damage resulting from Activities Dangerous to the Evironment, June 21, 1993, 32 ILM 480

Convention on Civil Liability for Oil Damage, November 29, 1969, UNTS 3, 9 ILM 45 (1970)

Convention on Early Notification of a Nuclear Accident, September, 26, 1986, 25 ILM 1370 (1986)

Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971, Brussels, December 18, 1971, 1110 UNTS 57

Convention on International Liability for Damage Caused by Space Objects, March 29, 1972, 961 UNTS 187

Convention on Long -range Transboundary Air Pollution, November, 13, 1979, 18 ILM 1442 (1979)

Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, December 29, 1972, 1046 UNTS 120

Convention on the Regulation of Antarctic Mineral Resource Activities, November 25, 1988, 27 ILM 859

Convention on Supplementary Compensation for Nuclear Damage, September 12, 1997, 36 ILM 1473 (1997)

Draft Articles on Prevention of Transboundary Harm From Hazardous Activities, Report of the International Law Commission, 53 session, UN Doc. A/56/10 (2001)

Draft Articles on Responsibility of States for Internationally Wronful Acts, Report of the International Law Commission, 53 session, UN Doc. A/56/10 (2001)

Draft Principles on the Allocation of Loss in the Case of Transboundary Harm Arising Out of Hazardous Activities, Report of the International Law Commission, 58th session, UN Doc A/61/10 (2006)

Paris Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, 956 UNTS 251, as amended by the Additional Protocol of January 28, 1964, 956 UNTS 335, by the Protocol of November 16, 1982, 1650 UNTS 444, and by the Protocol of February 2004

Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Waste and their Disposal, December 10, 1999

Protocol to Amend the Brussels Convention Supplementary to the Paris Convention on third Party Liability in the Field of Nuclear Energy, February 12, 2004

Protocol to Amend the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, November 27, 1992

Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage, September 12, 36 ILM 1454 (1997)

Resolution on the Responsibility and Liability under International Law for Environmental Damage, 4 September 1977, Strasbourg, 67-II Annuaire de l'institut de droit international 487 (1998)

Rio Declaration, Report of the United Nations Conference on Environment and Development, January 1, 1993, vol. I, Principle 2, UN Doc. A/conf.151/26/REV.1

Stockholm Declaration, Report of the United Nations Conference on the Human Environment and Development, January 1, 1973 vol. I, UN Doc. A/CONF.48/14/REV.1

United Nations Convention on the Law of the Sea (UNCLOS), December 10 1982, 21 ILM 1261 (1982)

Vienna Convention on Civil Liability for Nuclear Damage, May 21, 1963, 1063 UNTS 265

EU LEGILSATION

Consolidated version of the Treaty on the Functioning of the European Union [2008] C 115/161

Council Directive 92/43/EEC of 21 May 1992 on the Conservation of natural habitats and of wild fauna and flora (1992) OJ L 206

Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (1979) OJ L 103

Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on Environmental Liability with Regard to the Prevention and Remedying of Environmental Damage (2004) OJ L 143

Treaty Establishing the European Union of July 29, 1992 (1992) OJ C 191

INTERNET SOURCES

Basel Action Network < http://www.ban.org> accessed February 8, 2011

Draft technical guidelines on transboundary movements of used electronic and electrical equipment and e-waste, in particular regarding the distinction between waste and non-waste under the Basel Convention (draft for consultation, version 21 February 2011) < *www.basel.int/techmatters/e_wastes/guidelines/guidelines/2011-02-25.doc*>accessed on March 16, 2011

'Environmental Policy', (Institute for Study in Civil Society)
<http://www.civitas.org.uk/eufacts/FSENV/ENV1.html> accessed April 1, 2011

Euratom Treaty http://eur-lex.europa.eu/en/treaties/dat/12006A/12006A.htm> accessed 15 March 2011

'Extended Producer Responsibility' (OECD) <http://www.oecd.org/document/19/0,3746,en_2649_34281_35158227_1_1_1_00.html> accessed March 1, 2011

'FAQ on European Environmental Liability Directive', (IHS, April 27, 2007) http://www.ihs.com/news/eu-en-polluters-pay-faq-4-07.htm accessed April 30, 2011

'Code of Practice on the International Transboundary Movement of Radioactive Waste', (IAEA, November13,1990,INFCIRC/98386)

<http://www.iaea.org/Publications/Documents/Infcircs/Others/inf386.shtml> accessed on April 13, 2011

Impact Assessment, Liability and Redress, Decision V/18 adopted in 5th meeting of Conference of Parties, UNEP/CBD/COP/5/23, (CBD) http://www.cbd.int/doc/?meeting=cop-05> accessed on March 1, 2011

Fogelman Valerie, 'First Environmental Liability Directive cases from the European Court of Justice', (Commercial Risk Europe, June 4, 2010) < http://www.commercialriskeurope.com/cre/190/57/First-Environmental-Liability-Directive-cases-from-European-Court-of-Justice/> accessed April, 30 2011

Interim Guidelines for the Implementation of Decision V/23 'Enlargement of the Scope of the Technical Cooperation Trust Fund' http://www.basel.int/meetings/interguide00.html accessed April 1, 2011

Liability and Redress in the context of Paragraph 2 of Article 14 of Convention on Biological Diversity: An analysis of Pertinent Issue, UNEP/CBD/EG-L&R1/2/Rev1 (CBD, August 9, 2005) http://www.cbd.int/doc/?mtg=EGLR-01 accessed March 20, 2011>

'Slovenian Report on Nuclear Safety', (Ministry of the Environment and Spatial Planning of the Republic of Slovenia, June 2010) accessed on February 27">http://www.ujv.gov.si>accessed on February 27, 2011

Nuclear emergency response must be upgraded in light of Japanese crises, (UN News Centre, March 21, 2011)<http://www.un.org/apps/news/story.asp?NewsID=37834&Cr=japan&Cr1> accessed February 20, 2011

'Operators with instalations located close to a polluted area may be deemed to be liable for the pollution' (Court of Justice of the European Union, Press Release No. 25/10, March 9, 2010) http://curia.europa.eu/jcms/upload/docs/application/pdf/2010-03/cp100025en.pdf> accessed April 12, 2011

Pearce David and Moran Dominic, 'The economic value of biodiversity' <http://www.cbd.int/doc/external/iucn/iucn-biodiversity-value-1994-en.pdf> accessed February 21, 2011 Report of the Group of Legal and Technical Experts on Liability and Redress in the context of Paragraph 2 Article 14 of the Convention on Biological Diversity, UNEP/COP/8/27/Add 3, (CBD, October 18, 2005) http://www.cbd.int/doc/meetings/cop/cop-08/official/cop-08-27-add3-en.pdf >accessed April 30, 2011

Summary of submission by parties received by Executive Secretary on liability and redress, UNEP/CBD/EG-L&R/INF/3 (2005), (CBD, September 2, 2005) < http://www.cbd.int/doc/meetings/lr/eglr-01/information/eglr-01-inf-03-en.pdf> accessed March

< http://www.cbd.int/doc/meetings/lr/eglr-01/information/eglr-01-inf-03-en.pdf> accessed March 15, 2011

Synthesis report on technical information relating to damage to biological diversity and approaches to valuation and restoration of damage to biological diversity, as well as information on national/domestic measures and experiences, Conference of the Parties to the Convention on Biological Diversity, UNEP/CBD COP/9/20/A(2008)(CBD, March 20, 2008)

< http://www.cbd.int/doc/meetings/cop/cop-09/official/cop-09-20-add1-en.pdf> accessed on March 1, 2011

Wolfrum R, Langenfeld C., Minnerop P., 'Environmental Liability in International Law, Towards a Coherent Conception', (Max Plank Institute for Comparative Public Law and International Law, November 2004)

< http://www.umweltdaten.de/publikationen/fpdf-k/k2942.pdf> accessed April 10, 2011