Due Diligence Obligations and Transboundary Harm

From Environment to Cybersecurity

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Publications

(1) Akiko TAKANO, Land-Based Pollution to the Sea and Due Diligence Obligations, *Journal of Law, Policy and Globalization* (IISTE) Vol. 60, 2017, pp. 92–98, April 2017

(2) Akiko TAKANO, Due Diligence Obligations and Transboundary Environmental Harm: Cybersecurity Applications, *Laws* (MDIP) vol. 7(4), no. 36, (pp. 1–12), October 31, 2018

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Abstract

The purpose of this thesis is to provide an analysis of State obligations to prevent significant transboundary harm and an examination of the concept of due diligence in customary law. Due diligence is a long-established yet evolving principle of international law and may be an important tool not only for dealing with traditional environmental issues but also for responding to the complex and a fast-changing area of cybersecurity. This thesis explores the notion of the due diligence principle in the areas of land-based pollution to the sea, international watercourses, and cybersecurity.

The thesis examines if States have a due obligation to prevent land-based pollution to the sea that could bring about serious transboundary environmental harm under Part XII of the United Nations Convention on the Law of the Sea (UNCLOS) and customary law. The thesis then analyzes procedural duties in the context of international watercourses that have been developed and consolidated to underline due diligence obligations. States are endeavoring to take stricter measures to prevent cyber incidents by developing appropriate legislation that may serve as a substitute for due diligence obligations under customary law. The thesis concludes that non-State actors have "indirect" due diligence obligations under customary law in terms of cybersecurity if States impose obligations on the private sector in their domestic law.

Table of Contents

Chapter 1 Introduction

1. Background and Problem Definitions

1.1 State Responsibilities

Certain State activities are increasingly borderless, and such activities may lead to significant harm within or beyond States because of the transboundary effect. For example, land-based pollution to the sea could raise major concerns about pollution of the marine environments of neighboring countries. Unreasonable and inequitable use of river water in an upstream country could negatively impact the water quality in downstream countries. Air pollution as a result of industrial activities in one country may lead to transboundary air pollution. Such cross-border harm is not limited to the traditional areas of environment law; it may be an issue for cybersecurity law, which must respond to rapid technological development. A lack of regulation of cyber systems in one State may pose a threat to international peace and security in the form of cyberattacks. These examples show that transboundary harm as a result of contamination or uncontrolled activities across borders is a vital concern,[1] and they are among the most pressing issues that require international cooperation.

However, while harm does not recognize borders, significant challenges exist regarding the creation of international legal frameworks to control harmful activities beyond State territories. States have the sovereign right to exploit their own resources in accordance with the Charter of the United Nations[2] and the principles of international law in their territories. Consequently,

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[1] S. Jayakumar, Tommy Koh, Robert Beckman, Hao Duy Phan, eds., *Transboundary Pollution, Evolving Issues of International Law and Policy* ch.1 at 12 (Edward Elgar 2015).

[2] UN Charter Article 2

imposing land-based pollution control on States through an international legal framework, for example, may infringe upon State sovereignty and lead to social and economic consequences. In the same manner, regulating international watercourses is likely to lead to strong objections from upstream States, since such regulations would restrict their opportunities to use river water. In the areas of cybersecurity too, some States are not willing to establish international agreements to control cyberspace because of national security concerns, as well as possible infringements upon State sovereignty. Nevertheless, the international community has attempted to create international legal principles to respond to concerns of transboundary harm. In this respect, the due diligence principle may be a useful tool for responding to complex and modern legal issues.

1.2 Customary Law

A State's activities within its territory may have environmental consequences for other States. While States do not have an absolute obligation to prevent transboundary environmental harm, customary international law widely recognizes that States have a due diligence obligation: that is, an obligation to take diligence measures to prevent or minimize significant transboundary harm.[3]

Due diligence obligations are crucial for States seeking to prevent transboundary harm and are an evolving principle of international law. While the due diligence principle has primarily been developed in areas related to the environment, it may be a valuable tool for managing the rapidly developing area of cybersecurity and the lack of international treaties in terms of States' rights and duties in this area.

[3] Draft Articles on Prevention of Transboundary Harm from Hazardous Activities, with commentaries, UN 2001, Commentary to Art 3, at 154, ¶ 7.

1.3 Problem Setting

Due diligence is normally assessed if a responsible State has complied with certain obligations and standards.[4] However, "certain obligations and standards" are not internationally defined and are considered flexible.[5] Indeed, due diligence is one of the most ambiguous terms in international liability and State responsibility.[6] This vagueness is problematic because the notion is intended to clarify States' obligations to take measures to protect persons or activities within or beyond their respective territories to prevent harmful events and outcomes.

The definition of due diligence can vary depending on the circumstances of each case, as the International Law Association Study Group First Report concludes.[7] Until recently, there were limitations and uncertainty surrounding the standard of due diligence and the application of State responsibility due to the lack of related cases and prior studies. This situation indicates that the concept is not clear in terms of State responsibilities and due diligence obligations. It is also uncertain whether the concept of due diligence in environmental areas applies to the area of cybersecurity.

In this respect, the recent decisions made by the International Court of Justice (ICJ) in the *Pulp Mills*[8] and *Costa Rica v. Nicaragua/Nicaragua v. Costa Rica*[9] cases, as well as the

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[4] Timo Koivurova, *Due Diligence*, (MPEPIL, 2010), http://opil.ouplaw.com/abstract/10.1093/law:epil/9780199231690/law-9780199231690-e1034?prd=EPIL

[5] Joanna Kulesza, *Due Diligence in International Law* 19 (Brill Nijhoff, 2016).

[6] Joanna Kulesza, *Due Diligence in International Law* 1 (Brill Nijhoff, 2016).

[7] ILA Study Group. *Due Diligence in International Law, First Report*, 2 (March 7, 2014). https://olympereseauinternational.files.wordpress.com/2015/07/due_diligence_-_first_report_2014.pdf

[8] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14.

[9] Case concerning Certain Activities Carried Out by Nicaragua in the Border Area. (*Costa Rica v. Nicaragua*) and Construction of a Road in Costa Rica along the San Juan River (*Nicaragua v. Costa Rica*), 2015, ICJ Rep. 665.

Advisory Opinion[10] of the Seabed Dispute Chamber of the International Tribunal for the Law of the Sea (ITLOS), have significantly contributed to the clarification of the due diligence concept in relation to the prevention of significant transboundary harm in the areas of land-based pollution to the sea and international watercourses. Nevertheless, the application of this concept to cyber law has not yet been established, as there have been no ICJ cases in terms of due diligence to date.

2. Literature Review

2.1 Prior Studies in the Law of the Sea

Land-based activities are one of the most significant sources of marine pollution.[11] Following the Fukushima nuclear power plant accident, several legal studies were published, mainly by Japanese scholars, on whether discharging contaminated water into the sea is permitted under the current legal framework— in particular, this line of research considers how to construe land-based pollution to the sea under international conventions such as the United Nations Convention on the Law of the Sea (UNCLOS)[12] and non-binding instruments such as UN declarations and guidelines. The majority of such studies focus on Part XII of UNCLOS, which pertains to the protection and preservation of the marine environment and includes analyses of general obligations to protect the marine environment set out in Articles 192 and 194 and specific provisions regarding land-based pollution in Articles 207 (Pollution from Land-Based Sources) and 213 (Enforcement with Respect to Pollution from Land-Based Sources).

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[10] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17.

[11] World Wide Fund for Nature (WWF), Marine Problem for Nature (March 12, 2017), http://wwf.panda.org/about_our_earth/blue_planet/problems/pollution/

[12] December 10, 1982, 1833 U.N.T.S. 3 (entered into force November 16, 1994) [UNCLOS].

It has been contended that these internationally agreed-upon instruments represent a rather "modest response"[13] and are "somewhat lacking," despite their broad utility as soft law instruments.[14] Such a "modest response" has resulted from the recognition that, regardless of the seriousness of land-based pollution to the sea, States may have to rely on non-binding legal instruments, including several international guidelines and declarations, owing to the State sovereignty limitation, as well as a lack of awareness of the potentially transboundary nature of land-based pollution.

At least one author has found that ocean dumping in the case of the Fukushima nuclear plant accident did not violate the provisions of UNCLOS, owing to "the flexible nature of its treaty language."[15] Furthermore, a report published by the Policy Alternatives Research Institute (University of Tokyo)[16] suggests that there are no explicit provisions in UNCLOS to ban the discharge of contaminated water from land. The report also states that only a general obligation exists (under Articles 192 and 194 of UNCLOS) to protect the marine environment, as long as no specific damage is inflicted on neighboring countries.[17]

One researcher argues that, because of the significant discretionary power given to States under Articles 192, 194, and 207 of UNCLOS, it is not easy to accuse a State of reneging on its responsibilities unless it is evident that the State clearly opposes the obligation of pollution

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[13] Pierre-Marie Dupuy, Jorge E. Viñuales, *International Environmental Law* 104 (Cambridge, 2015).

[14] Donald R. Rothwell, Alex G. Oude Elferink, Karen N. Scott, and Tim Stephens, eds., *The Oxford Handbook of the Law of the Sea* 523, 526 (Oxford, 2015).

[15] Darian Ghorbi, *There's Something in the Water: The Inadequacy of International Anti-Dumping Laws as Applied to the Fukushima Daiichi Radioactive Water Discharge,* 27 Am U Int L Review 473, 505 (2012).

[16] Kentaro NISHIMOTO, "福島第一原子力発電所における汚染水の放出措置をめぐる国際法" (Pari PI 11 No. 01) [International Law regarding the Release of Contaminated Water in the Fukushima Daiichi Nuclear Power Plant] (Alternatives Research Institute, University of Tokyo, April 12, 2011), http://pari.u-tokyo.ac.jp/policy/PI11_01_nishimoto.html

[17] Id.

prevention.[18] Conversely, other scholars have postulated that, from a general viewpoint of land-based pollution control, each State has a responsibility regarding marine environment pollution from land-based sources.[19]

The prior studies cited above do not appear to expand their examination to due diligence obligations in detail, although some rely on soft law, such as UN guidelines. This may be because the Advisory Opinions of the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea (ITLOS) was only issued in February 2011,[20] and these studies were published before the *Philippines v. China* case in the Permanent Court of Arbitration in 2016.[21] Thus, the question of whether the obligation of due diligence could fill part of the gap resulting from the lack of implementation of Articles 207 and 213 of UNCLOS had not yet been thoroughly discussed.

In this regard, this thesis considers cases in which the due diligence obligation was developed through two Advisory Opinions rendered by ITLOS[22] and the recent *Philippines v. China* case in the Permanent Court of Arbitration,[23] as they clarify States' due diligence obligations to prevent marine pollution. Thus, the consideration of this Advisory Opinion would contribute to the understanding of States' obligations regarding land-based pollution to the sea.

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[18] Yukari TAKAMURA, [*Nuclear Accidents and International Law*] ch. 5 at 71 "原発事故の県境方への影響 その現状と課題" (*Shojihomu*, 2013) (Association of the Environmental Law Policy, ed.).

[19] Jayakumar eds. Transboundary Pollution, *Evolving Issues of International Law and Policy* ch. 6 at 154 (cited in note 1).

[20] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17.

21 In re Arbitration between the Republic of the Philippines and the People's Republic of China, 2016 PCA Case No. 2013–19.

22 Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area (Advisory Opinion on Seabed Activities), 2011 ITLOS Case 17: Request for an advisory opinion submitted by the Sub-Regional Fisheries Commission (SRFC), 2015 ITLOS Case 21.

23 In re Arbitration between the Republic of the Philippines and the People's Republic of China, 2016 PCA Case No. 2013–19.

2.2 International Watercourses and Cybersecurity

Pollution of fresh water could result in conflicts among riparian countries because fresh water is usually shared among more than two States.[24] McIntyre indicates that ICJ *Pulp Mills*[25] is a very important decision that clarifies the relationship between the procedural and substantial rules of international environmental law under the customary duty to prevent transboundary harm;[26] it confirms that procedural obligations are an integrated and indivisible whole, and that procedural obligations exist separately from substantial obligations.[27] According to Brunnée, the recent cases (*Pulp Mills* at ICJ, and the *Seabed Chamber* at ITLOS) clarified that procedural duty has the potential to strengthen aspects pertaining to States' obligations to prevent transboundary harm and enhance due diligence standards.[28]

Cybersecurity is high on the agenda for all sectors because of the central role of information, communication, and technologies (ICT) in modern society.[29] A note from the UN Group of Governmental Experts (GGE) on Developments in the Field of Information and Telecommunications in the Context of International Security indicates the importance of procedural obligations in the prevention of harm and encourages States to cooperate "to mitigate malicious ICT activity emanating from their territory."[30] The UN GGE also says

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[24] Jayakumar eds., Transboundary Pollution, *Evolving Issues of International Law and Policy* ch. 4 at 81, ch. 5 at 116 (cited in note 1).

[25] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14.

[26] Owen McIntyre, *The World Court's Ongoing Contribution to International Water Law: The Pulp Mills Case between Argentina and Uruguay*, 4 *Water Alternatives* 122, 122 (2011).

[27] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14.

[28] Jutta Brunnée, *Procedure and substance in international environmental law: Confused at a higher level?*, 5 Eur Soc Int L Issue 6 (2016) https://esil-sedi.eu/?p=1344

[29] Oren Gross, Cyber Responsibility to Protect: Legal Obligations of States Directly Affected by Cyber-Incidents. 48 Cornell Int L J 481, 481 (2015).

[30] UN, General Assembly, A/70/174, Developments in the field of information and telecommunications in the context of international security, *Group of Governmental Experts on Developments in the Field of Information and Telecommunications in the Context of International Security* (2015), at 10 ¶ 17(e), http://undocs.org/A/70/174

that States have a due diligence obligation to refrain from knowingly allowing their territories to be used for internationally wrongful acts using information and communication technologies.[31] In addition, Liu mentions that States are obligated to prevent cyberattacks originating in their territories.[32] Rule 6 of the Tallinn Manual 2.0, prepared by the International Group of Experts at the invitation of the NATO Cooperative Cyber Defence Centre of Excellence, indicates that the due diligence principle may be applied to cyberoperations.[33] However, the manual does not clearly state the kinds of action that drive the due diligence principle.[34]

3. Research Objective

The overall purpose of this thesis is to provide an analysis of the due diligence notion with respect to the environment, comprising four respective purposes: (1) The thesis analyzes whether States have an obligation to control the spread of land-based pollution to the sea under Articles 207 and 213 of UNCLOS and due diligence obligations; (2) The thesis examines the procedural duties of due diligence obligations in the context of international watercourses; (3) The thesis considers whether due diligence obligations may be used as a cybersecurity tool, and examines possible procedural duties, taking into account that few international treaties exist in the area of cybersecurity; and (4) The thesis raises the question of whether due diligence obligations are applicable to the private sector.

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[31] Id. at 8 ¶ 13(c),

[32] Ian Yuying Liu. *State responsibility and cyberattacks: Defining due diligence obligations* 4 The Indonesian J Int and Comparative L 191, 194 (2017).

[33] Michael N. Schmitt, and Liis Vihul, eds. *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations* 31 (Cambridge 2017).

34 Olivia Hankinson, *Due diligence and the gray zones of international cyberspace laws*. 39 *MJIL* (2017). http://www.mjilonline.org/due-diligence-and-the-gray-zones-of-international-cyberspace-laws/

4. Outline

First, this thesis examines the notion and development of due diligence obligations in Chapter 2, analyzing the no-harm principle, duty of prevention, and threshold of significant harm. Then, it specifically discusses due diligence obligations in the areas of the law of the sea, international watercourses, and cyber-diligence. In Chapter 3, beginning with an analysis of contaminated water discharge in the Fukushima nuclear power plant accident, the thesis discusses whether States have an obligation to control the spread of land-based pollution to the sea under Articles 207 and 213 of UNCLOS. In the course of this analysis, the thesis refers to a case in which the due diligence obligation was developed through two Advisory Opinions rendered by ITLOS[35] and the recent *Philippines v. China* case in the Permanent Court of Arbitration.[36] Chapter 3 then presents a regional framework and cooperation program that may supplement the specific provisions for preventing land-based pollution from spreading into the sea under UNCLOS, as well as customary law of due diligence obligations.

In Chapter 4, the thesis analyzes the procedural duties of due diligence obligations in international watercourses. It also explores whether due diligence obligations may be a critical tool in responding to fast-changing cyberspace law, as well as the relevant procedural duties. The thesis discusses whether States have a responsibility to prevent transboundary harm caused by non-State actors in relation to cybersecurity incidents. The thesis reviews the existing literature on due diligence obligations in international water law and cybersecurity, along with ICJ cases relating to procedural duties followed by the conclusion in Chapter 5.

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35 Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area (Advisory Opinion on Seabed Activities), 2011 ITLOS Case 17: Request for an advisory opinion submitted by the Sub-Regional Fisheries Commission (SRFC), 2015 ITLOS Case 21.

36 In re Arbitration between the Republic of the Philippines and the People's Republic of China, 2016 PCA Case No. 2013–19.

Chapter 2 Notion of Due Diligence Obligation and its Development

1. Principles

1.1 No-Harm Principle

States have a responsibility to ensure that activities within their jurisdiction do not cause harm to the environments of other States, as established in the Rio Declaration (Principle 2).[1] The prevention of transboundary harm is a fundamental principle in international environmental law, and related State obligations are generally interpreted as due diligence obligations.[2] Due diligence is an important tool in many disparate areas in international law[3] and is an evolving principle of international law[4], although the concept has mainly been developed in the area of the environment. The due diligence obligation requires States to take measures to protect persons or activities beyond their respective territories to prevent harmful events and outcomes.[5]

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1 UN Doc. Rio Declaration, A/CONF.151/26 (August 12, 1992) at annex I.

2 UN Commission on Sustainable Development, Report of the Expert Group Meeting on Identification of Principles of International Law for Sustainable Development, Geneva, Switzerland, (September 26–28, 1995). http://www.un.org/documents/ecosoc/cn17/1996/background/ecn171996-bp3.htm

3 On the one hand, in the human rights context, due diligence is considered a standard of conduct required to discharge an obligation; on the other, in a business context, due diligence is understood as a process for managing business risks (Jonathan Bonnitcha and Robert McCorquodale, *The Concept of "Due Diligence" in the UN Guiding Principles on Business and Human Rights,* 28 Eur J Int L, 899, 901(2017)). This paper focuses on the State-based due diligence concept rather than the concept centered on human rights or business contexts, as it discusses transboundary environmental harm and State obligations related to the Law of the Sea and cybersecurity.

4 Tim Stephens and Duncan French, *ILA Study Group on Due Diligence in International Law, Second Report,* 47 (July 2016), http://www.ila-hq.org/index.php/study-groups.

5 Draft Articles on Prevention of Transboundary Harm from Hazardous Activities, with commentaries, UN 2001, Commentary to Art 3, 154, ¶ 7. In addition, the Convention on the Law of the Non-Navigational Uses of International Watercourses adopted by the General Assembly of the United Nations (May 21, 1997) Art 7—Obligation Not to Cause Significant Harm, and the Convention on the Protection and Use of Transboundary Watercourses and International Lakes

The *Trail Smelter* (*United States v. Canada*) case relating to transboundary air pollution (smelter's emissions) asserts the following:

> No State has the right to use or permit the use of its territory in such a manner as to cause injury by the emission of fumes in or transported to the territory of another or the properties or persons therein, when the case is of serious consequence and injury is established by clear and convincing evidence.[6]

Following the *Trail Smelter* (*United States v. Canada*) case, the ICJ confirmed the customary nature of this principle in 1949 in *Corfu Channel*[7] when referring to a State's obligation to refrain from knowingly allowing its territory to be used for acts that infringe on the rights of other States. However, this "do no harm principle" remained a primary norm in the criteria of States' responsibilities to other countries, and it was eventually recognized in Principle 21 of the Stockholm Declaration[8] and Principle 2 of the Rio Declaration,[9] which provide the legal basis for international standards. While customary law manages States' responsibilities in transboundary harm, the term "due diligence" is seldom used in international treaties.[10] This may be due to the difficulties of establishing internationally agreed-upon treaties because States have conflicting interests.

(Water Convention), adopted in Helsinki (March 17, 1992), the United Nations Economic Commission for Europe, Art 3 Prevention, Control, and Reduction.

[6] Trail Smelter case (*United States v. Canada)*, 1938 and 1941, 3 RIAA 1905 at 1965.

[7] Corfu Channel Case (*UK v. Albania*) (Merits), 1949 ICJ Rep. 4 at 21 ¶ 67.

[8] Declaration of the United Nations Conference on the Human Environment, Stockholm (June 16, 1972).

[9] UN Doc. Rio Declaration, A/CONF.151/26 (August 12, 1992) at annex I.

[10] Duncan French and Tim Stephens, *ILA Study Group on Due Diligence in International Law, First Report,*6 (March 7, 2014), https://olympereseauinternational.files.wordpress.com/2015/07/due_diligence_-_first_report_2014.pdf

1.2 Prevention

Regarding whether the no-harm principle encompasses the duty to prevent all significant transboundary harm, as the Advisory Opinions on the *Legality of Nuclear Weapons*[11] and *Gabcikovo–Nagymaros*[12] cases indicate, States have a general obligation to respect the environment in terms of their activities within and beyond their territories. This principle of no harm is breached only when the State of origin has not acted diligently regarding its own activities over State-owned enterprises or private activities.[13]

As the *Genocide*[14] case clarifies, the principle of due diligence is an obligation of conduct, rather than an obligation to achieve a particular result; that is, States are not required to achieve specific results, as long as they exercise the best possible efforts to obtain the results. If a State fails to take "all reasonable or necessary measures to prevent" harm, then the State is liable for its conduct, not for the result of the harm.[15] On the contrary, a State's failure to enforce the rule is considered the State's failure of due diligence, as was claimed in the transboundary air pollution case of Aerial Herbicide Spraying (*Ecuador v. Colombia*).[16]

The Draft Articles on the Prevention of Transboundary Harm from Hazardous Activities (ILC)[17] also indicate that States have a duty to prevent significant transboundary harm (Article 3) and provide an assessment of possible transboundary harm (Article 7). In addition, the duty measured to prevent or minimize activities is one of due diligence obligation, and the due

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[11] *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, 1996, ICJ Rep 226 at 241–242, ¶ 29.

[12] *Case concerning the Gabcikovo–Nagymaros Project* (*Hungary/Slovakia*), 1997 ICJ Rep.7 at 41, ¶ 53.

[13] French, *ILA Study Group on Due Diligence in International Law, First Report,* 26 (cited in note 10)

[14] Application of the Convention on the Protection and Punishment of the Crime of Genocide (*Bosnia v. Serbia*) 2007 ICJ Rep.43 at 221, ¶ 430.

[15] Russell Buchan. *Cyberspace, non-State actors and the obligation to prevent transboundary harm.* 21 J Conflict & Security Law 429, 434 (2016).

[16] Case concerning *Aerial Herbicide Spraying (Ecuador v. Colombia),* 'Reply of Equator' (January 31, 2011), ICJ Pleadings at Section IV. Failure to Act with Due Diligence to Prevent Transboundary Harm.

[17] Draft Articles on Prevention of Transboundary Harm from Hazardous Activities, with commentaries, UN 2001.

diligence standard regarding transboundary environmental harm should be examined to determine whether the standard under consideration is appropriate and proportional to the risk of transboundary harm in a particular instance.[18]

The question here concerns the definition of the threshold of "significant transboundary harm" in light of a State's due diligence obligations. One writer says that States are expected to prove their due diligence by preventing foreseeable significant damage or at least minimizing risk to avoid such harm.[19] Another says that the standard should be appropriate and proportional to the degree of risk of transboundary harm in a particular instance.[20]

In this respect, the Commentaries of Draft Articles on the Prevention of Transboundary Harm from Hazardous Activities define "significant" as "determined by factual and objective criteria, also [involving] a value determination which depends on the circumstances of a particular case and the period in which such determination is made,"[21] and "harm" as "harm caused to persons, property or the environment," while "transboundary harm" means "harm caused in the territory of or in other places under the jurisdiction or control of a State other than the State of origin, whether or not the States concerned share a common border."[22] The Commentaries do not appear to provide a specific meaning for "harm," but the ways in which the term is used by the aforementioned writers indicate that it is synonymous with "damage" or "risk."

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[18] Id, Article 3 at 154 ¶ (11).

[19] French, *ILA Study Group on Due Diligence in International Law, First Report,* 26 (cited in note 10)

[20] S. Jayakumar, Tommy Koh, Robert Beckman, Hao Duy Phan, eds., *Transboundary Pollution, Evolving Issues of International Law and Policy* ch.1 at 16 (Edward Elgar 2015).

[21] Id at 153 ¶ (7).

[22] Id, Article 2 at 151–152.

2. Environment and Cybersecurity

2.1 Comparison

States have a duty to prevent transboundary damage, and such due diligence obligations have most significantly been developed in the area of environmental law. While cybersecurity is a fast-changing area of law, owing to its cross-border nature, it seems to share some specific features with environmental law. Such features may help define the concept and applicability of due diligence obligations before exploring issues in the specific area.

Sovereignty is the first aspect that should be compared here. Cyberspace has been considered a context in which the traditional rules and principles of international law do not apply, whereas in recent State practices, customary international law is, in principle, applicable to cyberspace with some adaptations for its specific characteristics.[23] This applicability is particularly important because cyberspace lacks a major intergovernmental governance structure.[24] Cyberspace is also not immune to State sovereignty claims, and States have imposed an obligation to prevent transboundary harm from occurring in activities within their sovereign territory.[25]

In terms of State responsibility, neighboring countries are likely to suffer from environmental harm such as water pollution, and the time spent suffering from ill effects or recovering from them may be significant. On the other hand, in the case of cybersecurity, States must consider instant spillover to other States as the result of network connectivity. As such, States may be required to take immediate action to protect individuals' rights under the notion of sovereignty and human rights laws in cases of data theft, since such incidents may invade the privacy or

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[23] Wolff Heintschel von Heinegg, *Territorial Sovereignty and Neutrality in Cyberspace*. Int Law Stud 89, 123, 124 (2013).

[24] Andreas Zimmermann, *International Law and "Cyber Space."* Eur Soc Int L 3, 1, 6 (2014).

[25] Russel Buchan, *Cyberspace, non-State actors and the obligation to prevent transboundary harm*. 21 J Conflict & Security L 429, 431 (2016).

basic rights of individuals.[26] In particular, there are apparently stronger privacy concerns related to the collection of information that is shared with other States in cyberspace. Recovering from the damage of the system itself may be faster regarding cybersecurity than in instances in which suffering is caused by environmental issues, which tend to require significant amounts of time, except for cases in which an invasion of privacy has occurred.

Significant transboundary environmental harm may affect either physical or nonphysical aspects, as in cases of financial loss and damage to natural resources, which States are expected to manage, whereas cyberattacks may result in serious risks to national infrastructure, financial loss, and nonphysical risks such as privacy, as well as possible physical risks, as they can endanger human health and lives.[27] Therefore, the environment and cyberspace share features regarding due diligence obligations. In addition, the environment and ICT may both be considered "common concerns to humanity" because both are essential for most, if not all, people. While sovereign territory only becomes a primary issue in the case of the environment, with cybersecurity, State territories are not only used to launch cyberattacks; their role may also be extended to that of a directly affected State, which puts their own nation, other States, and non-State actors at risk.[28]

2.2 Law of the Sea

The presence of land-based pollution in the sea could result in the transboundary effect of marine pollution. Discharging "contaminated water" from Fukushima Daiichi Nuclear Plant attracted interest in the question of whether States have an obligation to prevent significant transboundary harm in the current international framework, for example, through the general

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[26] Oren Gross, *Cyber Responsibility to Protect: Legal Obligations of States Directly Affected by Cyber-Incidents*. Cornell Intl L J 48, 481 and 493 (2015).

[27] Id.

[28] Id at 495.

obligations set out in Articles 192 and 194, or the specific obligations set out in Article 207 of UNCLOS, regional conventions, international declarations, or customary law on due diligence obligations.

In terms of State responsibility, it is not necessary for all States to take similar measures against foreseen consequences because due diligence obligations may be imposed on the basis of States' "capabilities," [29] given the differences in their stages of economic and technological development. However, this difference in obligations in light of technical capabilities has a limitation; States may use this principle to avoid obligations, which "jeopardizes the uniform application of the highest standards of protection of the marine environment" and also inconveniences States.[30] According to the Seabed Mining Advisory Opinion of the ITLOS Seabed Dispute Chamber, precaution is "an integral part of the general obligation of due diligence,"[31] and States may be requested to perform specific actions, including creating a legislative and regulatory framework despite insufficient evidence, as long as the consequences are foreseen under the precautionary principle.[32]

2.3 International Watercourses

Due diligence requires States to make reasonable efforts to inform affected entities and take appropriate measures in a timely manner. It should therefore be understood that States have the duty to notify other affected parties as soon as a plan is received and then send a detailed

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[29] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17 at 48 ¶ 161.

[30] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17 at 41 ¶ 159.

[31] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17 at 40 ¶ 131.

[32] Duncan French and Tim Stephens, *ILA Study Group on Due Diligence in International Law, First Report,* 26 (March 7, 2014), https://olympereseauinternational.files.wordpress.com/2015/07/due_diligence_-_first_report_2014.pdf

notification to neighboring States on the basis of an environmental impact assessment (EIA).[33] In the case of *Pulp Mills,* the ICJ clarifies the nature and extent of due diligence obligations in relation to the duty to prevent transboundary harm, and the Court stresses the importance of inter-State notifications of new projects or activities, connecting the act of notification to that of exercise.[34]

In order to meet their due diligence obligations, States must establish various domestic and transboundary procedures to prevent significant transboundary damage.[35] A breach of procedural obligations constitutes a critical component in establishing a lack of due diligence standards, as required under the customary duty to prevent significant transboundary harm.

2.4 Cyber-Diligence

States have a due diligence obligation to refrain from knowingly allowing their territories to be used for internationally wrongful acts involving the use of information and communication technologies.[36] States should also have the obligation to prevent cyberattacks from originating within their borders.[37] However, regarding cybersecurity, specific obligations may be required owing to the lack of internationally established law as well as the differences between features of cybersecurity and environmental cases.

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[33] Owen McIntyre, *The World Court's Ongoing Contribution to International Water Law: The Pulp Mills Case between Argentina and Uruguay*, 4 *Water Alternatives* 122, 140 (2011).

[34] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14, 60 at ¶ 120.

[35] French, *ILA Study Group on Due Diligence in International Law, First Report,* 28 (cited in note 10)

[36] UN, General Assembly, A/70/174, Developments in the field of information and telecommunications in the context of international security, *Group of Governmental Experts on Developments in the Field of Information and Telecommunications in the Context of International Security,* at 8 ¶ 16(c), http://undocs.org/A/70/174

[37] Ian Yuying Liu. *State responsibility and cyberattacks: Defining due diligence obligations* 4 , The Indonesian J Int and Comparative L 191, 194 (2017).

Consequently, the concept of due diligence in environmental law and the law of the sea may not be directly applicable to cybersecurity in terms of procedural duties. In addition, cyberspace cases can contain higher risks than environmental cases. Therefore, unique procedural duties are likely to be required, which will be discussed in Chapter 4.

Chapter 3 Land-Based Pollution to the Sea and Due Diligence Obligations

1. Introduction

1.1 Fukushima Nuclear Accident

Land-based activities are some of the most significant sources of marine pollution; they are estimated to cause over 80 percent of all marine pollution.[1] In the sea, land-based pollution such as oil spills, fertilizer runoff, solid garbage, sewage disposal, and other toxic materials not only damage the marine environment but also harm marine life. Moreover, human health may be affected through the consumption of contaminated seafood. This is evinced by Minamata disease, a neurological condition first identified in Kumamoto Prefecture in Japan, which was caused by mercury discharged into industrial wastewater from a chemical plant. Directly following the Great East Japan Earthquake on March 11, 2011, Tokyo Electric Power Company (TEPCO), the company that maintained Fukushima Daiichi's reactors, announced that between April 4 and April 10, 2011, it had released "about 10,400 cubic meters of slightly contaminated water (0.15 TBq [amount of radioactivity] total)" into the sea.[2]

In August 2013, it was revealed that radioactive contaminated water had leaked from the Fukushima Daiichi nuclear power plant.[3] TEPCO then began discharging the bypassed "clean

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[1] World Wide Fund for Nature (WWF), Marine Problem for Nature (March 12, 2017), http://wwf.panda.org/about_our_earth/blue_planet/problems/pollution/

[2] World Nuclear Association, *Fukushima Accident* (World Nuclear Association, September 2015), http://www.world-nuclear.org/info/Safety-and-Security/Safety-of-Plants/Fukushima-Accident/

[3] Id.

groundwater" around the Fukushima Daiichi nuclear power plant into the sea.[4] Management of the contaminated water was acknowledged as a significant and ongoing issue in the International Atomic Energy Agency's (IAEA) Mission Report to the Government of Japan published on May 13, 2015.[5]

Land-based pollution in the sea is of global significance because of the possible transboundary effects of marine pollution. Thus, the series of instances in which radioactive contaminated water was released from the disaster-stricken Fukushima I (Fukushima Daiichi) nuclear power plant in March 2011 raised major concerns about the pollution of the marine environment. Consequently, neighboring Pacific and Asian countries have voiced concerns about both the environmental and economic effects of this source of marine pollution.[6] Scientists, meanwhile, have claimed that uncertainty exists regarding the deliberate release of radioactive contaminated water and the environmental and safety impact that such actions might have on the ocean.

According to the "Impact on Seafood Safety of the Nuclear Accident in Japan" summary report issued by the World Health Organization (WHO) and the Food and Agricultural Organization of the United Nations (FAO), some seafood was found to be contaminated above regulatory limits in direct vicinity of the Fukushima Daiichi nuclear power plant, whereas radionuclide contamination in seafood outside of these areas was significantly below that of any public health concern, although the report's authors concluded that further developments should be closely monitored.[7]

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4 Fukushima Daiichi NPS Prompt Report 2014, Bypass of Clean Groundwater to Ocean Starts (TEPCO, May 21, 2014), http://www.tepco.co.jp/en/press/corp-com/release/2014/1236566_5892.html

5 IAEA, Mission Report to the Government of Japan: IAEA International Peer Review Mission on Mid- and Long-Term Roadmap Towards the Decommissioning of TEPCO's Fukushima Daiichi Nuclear Power Station Units 1–4 (Third Mission) (May 13, 2015), IAEA <https://www.iaea.org/sites/default/files/missionreport130515.pdf> at 13

6 IAEA, IAEA Project Monitors Radioactive Release from Fukushima Accident on Asia-Pacific Marine Environment (IAEA News Centre, December 12, 2012), https://www.iaea.org/newscenter/news/iaea-project-monitors-radioactive-release-fukushima-accident-asia-pacific-marine-environment

7 WHO/FAO, Impact on seafood safety of the nuclear accident in Japan (WHO, May 9, 2011), online: WHO <http://www.who.int/foodsafety/impact_seafood_safety_nuclear_accident_japan_090511.pdf>.

Overall, however, the WHO/FAO account claimed that there was no significant risk, which corresponded with the Japanese Nuclear and Industrial Safety Agency's advice that there had been no significant change in radioactivity levels in the sea as a result of the 0.15-TBq discharge in 2011.[8] A further report, the "Fukushima Daiichi Accident: Report by the Director General of the IAEA" published in August 2015 also noted that the new release of contaminated water into the sea had received the approval of the National Regulatory Authority and the acceptance of relevant stakeholders, including the Fukushima prefecture and the fishing industry.[9]

Notwithstanding such reports, however, significant concerns remain regarding safety, such as the fact that in the long term, radioactive waters released from the Fukushima nuclear site will enter the Sea of Japan along which China, Korea, and Russia also have coastlines, contaminating their respective marine environments.[10] Public concerns also exist regarding the effects of the contamination on the environment and seafood safety despite the preliminary findings of the above-mentioned WHO/FAO report.

The Fukushima accident and the deliberate release of contaminated water from the land to the sea in particular clearly provoked debate and further stimulated the conceptualization and regulation of marine pollution. As noted above, the management of contaminated water is still proving difficult even several years after the Fukushima Nuclear Power Plant accident. This illustrates the difficulties of managing land-based pollution to the sea as well as indicating the importance of clarifying States' obligations to prevent significant environmental harm.

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[8] World Nuclear Association, (cited in note 1)

[9] IAEA, *The Fukushima Daiichi Accident: Report by the Director General* (August 2015), http://www-pub.iaea.org/MTCD/Publications/PDF/Pub1710-ReportByTheDG-Web.pdf

[10] Energy and Climate Change Committee, *Building New Nuclear: The Challenges Ahead* (HC 2012–13, 117–II), "Written Evidence Submitted by Tim Deere-Jones" (NUC 33), online: House of Commons, archived at http://www.publications.parliament.uk/pa/cm201213/cmselect/cmenergy/117/117vw17.htm

1.2 Purpose

The purpose of this chapter is to examine whether States have an obligation to control the spread of land-based pollution to the sea under Articles 207 (Pollution from Land-Based Sources) and 213 (Enforcement with Respect to Pollution from Land-Based Sources) of UNCLOS.[11] In particular, this chapter examines how the concept of due diligence obligations developed in the Advisory Opinion of the ITLOS Seabed Disputes Chamber cases 17 (*Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area*)[12] and 21 (*Request for an advisory opinion submitted by the Sub-Regional Fisheries Commission [SRFC]),*[13] as well as the award rendered in the *Philippines v. China* case,[14] could fill the gap resulting from the lack of implementation of Articles 207 and 213 of UNCLOS in relation to marine pollution in general and land-based pollution to the sea in particular.

2. Law of the Sea and Marine Pollution

2.1 Applicability of UNCLOS

In the context of the legal mechanisms that address marine pollution, UNCLOS is considered one of the most comprehensive and complex multilateral treaties ever established regarding the law of the sea.[15] Regarding the legal regime for marine pollution, within the law of the sea, "Pollution of the marine environment" is defined in Article 1(4) of UNCLOS as follows:

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[11] December 10, 1982, 1833 U.N.T.S. 3 (entered into force November 16, 1994) [UNCLOS].

[12] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17.

[13] Request for an advisory opinion submitted by the Sub-Regional Fisheries Commission (SRFC), 2015 ITLOS Case 21.

[14] In re Arbitration Between the Republic of the Philippines and the People's Republic of China, 2016 PCA Case No. 2013–19.

[15] Martin Dixon, *Textbook on International Law* 7th ed., 218 (Oxford, 2013).

> … the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities.[16]

Part XII of UNCLOS establishes provisions for the protection and preservation of the marine environment on a global, regional, and local basis. Article 237 of UNCLOS indicates that any obligations regarding the protection and preservation of the marine environment under other conventions—that is, specific obligations assumed by States under special conventions, with respect to the protection and preservation of the marine environment—should be carried out in a manner that is consistent with the general principles and objectives of the Convention. In fact, these provisions are not simply legal texts; the Convention also comprises political and legal work documents that have resulted from international politics and relations.[17]

After Article 192 presents general obligations, Article 194 continues with the statement that States must take all necessary measures to prevent, reduce, and control pollution of the marine environment from any source. Article 194, para. 2 also specifies that States shall take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environments. The Convention further advocates that States shall adopt laws and regulations to prevent, reduce, and control pollution of the marine environment from land-based sources (Article 207, para. 1).

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[16] December 10, 1982, 1833 UNTS. 3 (entered into force November 16, 1994) [UNCLOS].

[17] Arnd Bernaerts, *Bernaerts' guide to the 1982 United Nations Convention of the Law of the Sea*, 9 (Trafford, 2006)

2.2 Further Argument for Inadequacy of Control

A further argument for the inadequacy of control over land-based pollution to the sea under the current legal framework is found in the *Oxford Handbook of the Law of the Sea*, which asserts that UNCLOS Articles 207 and 213 leave "a great deal of discretion to adopt stricter, or indeed weaker, national or regional provisions."[18] Unquestionably, a review of the text of the provisions in UNCLOS does reveal the cautionary nature of this document's approach to land-based pollution to the sea, as evidenced through its definition of "dumping" in Article 1(5)(a)(i). Discretion is afforded to States in Article 207, para. 1. According to Article 1(5)(a), "dumping" means: (i) any deliberate disposal of wastes or other matter from vessels, aircraft, platforms, or other man-made structures at sea and (ii) any deliberate disposal of vessels, aircraft, platforms, or other man-made structures at sea.

However, it should also be noted that UNCLOS includes a provision stating general principles and obligations concerning pollution prevention in addition to specifying particular obligations. States have expressed their discretionary power and sovereignty in adopting UNCLOS. In some cases, they impose clear and direct obligations with little flexibility in the standard, although the domestic process may be left to their discretion. It is not surprising that States retain discretionary power concerning the provisions of UNCLOS. Therefore, the additional conceptualizations and views of marine environmental protection that can be found in other settings are also worth examining. At the very least, such an examination will provide a better understanding of their representations in UNCLOS, as explained below.

The London Convention[19] may also be applicable to the prevention of marine pollution from

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[18] Donald R. Rothwell, Alex G. Oude Elferink, Karen N. Scott, and Tim Stephens, eds., *The Oxford Handbook of the Law of the Sea* (Oxford, 2015), Elizabeth A. Kirk, "Historical Development of the Legal Regime In relation to Marine Pollution" at 526.

[19] November 13, 1972, 1046 U.N.T.S. 138 (entered into force August 30, 1975).

waste dumping, as well as the related Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Protocol).[20] Issued in reaction to the unregulated dumping that took place in the late 1960s and early 1970s, the London Convention set out to control dumping in the sea and is noted as one of the first global conventions to protect the marine environment from human activity. Signed in 1972 and entered into force in 1975, its objective is to promote the effective control of all sources of marine pollution and take all practical steps to prevent pollution to the sea through the dumping of wastes and other matter.[21]

The London Convention was replaced by the London Protocol and finalized in 1996, and, today, almost all dumping is prohibited (barring some listed potentially "acceptable" wastes).[22] Ultimately, dumping so-called "high-level radioactive waste" was banned. However, land-based dumping is not included in the definition of Article 4.1 of the London Convention, an omission that has also been noted with respect to UNCLOS. Moreover, it could also be argued that this mechanism is related to State sovereignty, which would make it difficult to control land-based pollution under the London Convention.

3. States' Obligations and Responsibilities under Environmental Principles

3.1 Customary Law in Law of the Sea

An alternative view of the adequacy of current international treaties is based on an interpretation of UNCLOS that allows for the incorporation of customary law in relation to the protection of the marine environment and the principles of environmental law. Therefore, it is useful to

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[20] November 7, 1996 (1997) 36 ILM 1 (entered into force March 24, 2006), [*London Protocol*].

[21] November 13, 1972, 1046 UNTS 138 (entered into force August 30, 1975), [London Convention].

[22] November 7, 1996 (1997) 36 ILM 1 (entered into force March 24, 2006), [London Protocol].

consider the development of the law of the sea, which can be found in customary law and treaties. The importance of customary laws for the law of the sea was understated for many decades until the influence of economic development on marine pollution increased. In the *Trail Smelter Arbitration (United States v. Canada)* (1938, 1941)[23] case in 1941, a general principle of customary law was established that "States must not permit their nationals to discharge into the sea matter that could cause harm to the nationals of other States."[24] This is the rule of *sic utere tuo ut alienum non laedas*, which means that one must use one's own property in such a way that its use does not harm that of another— the so-called "no harm principle."

Meanwhile, dumping was increasingly being conducted in the sea between 1050 and 1960 because of land-based activities. Some countries, including Russia, France, the US, and the UK, were even dumping radioactive waste into the sea; for example, the US dumped radioactive waste off the northern Atlantic coastline of New England and into the Gulf of Mexico from 1946 until 1970, after which the London Convention entered into force.[25] Furthermore, the UK continued to dump radioactive waste into the sea even after the London Convention had come into effect, prompting five Nordic countries to officially protest the British refusal to comply with international law.[26] These dumps were carried out by ship, not from land. Meanwhile, Greenpeace has campaigned for a ban on the dumping of waste at sea since 1970.[27]

Customary law has proven rather valuable since then; in 1967, it was applied to the *Torrey Canyon* oil tanker accident in the context of marine pollution and the protection of the marine environment. In a later case, the International Court of Justice reiterated its position:

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[23] III RIAA 1905, online: UN <http://legal.un.org/riaa/cases/vol_III/1905-1982.pdf>.

[24] Robin R. Churchill and Allan V. Lowe, *The Law of the Sea* 332 (Manchester, 1999).

[25] David G. Spak, *The Need for a Ban on All Radioactive Waste Disposal in the Ocean*, 7 Nw J Int Law Bus 803, 817(1986).

[26] Id at 819.

[27] Remi Parmentier, *Greenpeace and the Dumping of Waste at Sea: A Case of Non-State Actors' Intervention in International Affairs* (1999) 4 International Negotiation 435.

> 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 the corpus of international law relating to the environment.[28]

The "no harm principle" led to the 1972 adoption of the Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration),[29] as well as the subsequent production of the Rio Declaration on Environment and Development (Rio Declaration) at the 1992 United Nations "Conference on Environment and Development."[30] The applicability of the principle was also confirmed when the International Law Commission (ILC) submitted a report on international liability for injurious consequences arising out of acts not prohibited by international law (Prevention of Transboundary Harm from Hazardous Activities) to the General Assembly in Resolution 56/82 of December 12, 2001, as well as by the decisions on the *Gabcikovo-Nagymaros Project* case in 1997[31] and the *Pulp Mills on the River Uruguay (Argentina v. Uruguay)* case in 2010.[32]

3.2 Due Diligence Obligation and UNCLOS

As previously discussed, due diligence is the obligation imposed upon States to take measures to protect persons or activities within or beyond their respective territories to prevent harmful events and outcomes (*Corfu Channel* case [*UK v. Albania*], Judgment, ICJ Reports 1949). The rights refer to "all unlawful acts that produce detrimental effects on another State." In the *Pulp Mills* case on the River Uruguay (*Argentina v. Uruguay*), Judgment, ICJ Reports 2010, the ICJ clarified the outlines of the obligation to "due diligence," and the case states an obligation of

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[28] Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, [1996] I.C.J. Rep. 1996 (I), at 241–2, ¶ 29.

[29] UN Doc. A/CONF.48/14/Rev.1 (1973), [*Stockholm Declaration*], principles 7 and 21.

[30] UN Doc. A/CONF.151/26 (Vol. I), August 12, 1992, [*Rio Declaration*] at annex I.

[31] Case concerning Gabcikovo-Nagymaros Project *(Hungary/Slovakia)*, I.C.J. Rep. 1997 at 41, ¶ 53.

[32] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, I.C.J. Rep. 2010 at 45, ¶ 101

cooperation for the implementation and application of appropriate measures for the preservation of the environment.

Meanwhile, following a review of the international treaty, negotiations over UNCLOS commenced in 1973, and nine years later, in 1982, the Convention was adopted; it entered into force in 1994. UNCLOS is considered one of the few examples of the imposition of obligations on States in relation to the protection of the marine environment, as seen in Part XII. The Convention includes provisions that impose both general and specific obligations. Article 207, para. 1 indicates that States shall adopt laws and regulations to prevent, reduce, and control pollution of the marine environment from land-based sources, considering internationally agreed-upon rules, standards, and recommended practices and procedures. Article 207, para. 2 adds that States shall take other measures as necessary to prevent, reduce, and control such pollution.

All States are obligated to apply these provisions because none are able to reverse the provisions in Part XII (Protection and Preservation of the Marine Environment, in particular, Article 213, as well as Articles 204–206 of UNCLOS).[33] This leads to the observation that States have "due diligence" obligations, requiring them to adopt and enforce laws and regulations to ensure the fulfillment of their responsibilities. A due diligence obligation has been developed to address the relationship between Article 194 (Measures to Prevent, Reduce, and Control Pollution of the Marine Environment) and Article 207 (Pollution from Land-based Sources).

[33] S. Jayakumar, Tommy Koh, Robert Beckman, Hao Duy Phan, eds., *Transboundary Pollution, Evolving Issues of International Law and Policy* 138 (Edward Elgar 2015).

3.3 Advisory Opinion

Regarding Article 194 of UNCLOS, which encompasses measures to prevent, reduce, and control pollution of the marine environment, it is "inappropriate" to conclude that these obligations are "completely open ended,"[34] as the general provisions (in Part XII) appear to attempt to incorporate harmonized policies and regulations, as well as international perspectives. In fact, the 2011 Advisory Opinion from the ITLOS Seabed Disputes Chamber (concerning "responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area")[35] provides critical guidance on the interpretation of the assertion that "*States shall take all measures necessary to ensure* [that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment]" in the Convention.

It emphasizes that the "responsibilities to ensure" are "due diligence" obligations, which means that a State must take all measures available within its legal system, such as the adoption of laws and regulations "appropriate to securing compliance by persons under their jurisdiction."[36] The ITLOS Advisory Opinion indeed draws the conclusion that each State has "an obligation to deploy adequate means, to exercise best efforts, to do the utmost, to obtain the result."[37] The same Advisory Opinion also referred to direct obligations to assist the relevant authority, apply a precautionary approach, apply best environmental practices, adopt measures to ensure the provisions of guarantees in the event of an emergency order by the authority for protection of the marine environment, and provide recourse for compensation regarding damage caused by pollution. Moreover, the Seabed Disputes Chamber explicitly states that the application of the

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[34] Elizabeth A. Kirk, *Science and the International Regulation of Marine Pollution* in Rothwell, Oude Elferink, Scott, and Stephens, eds., *The Oxford Handbook of the Law of the Sea,* ch. 23 at 522 (Oxford, 2015).

[35] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17 at 35 ¶ 113.

[36] James Harrison, Significant International Environmental Cases: 2010–11, 23 J Env L 517, 518 (2011).

[37] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17 at 34 ¶ 110.

precautionary approach is a legal obligation as an established legal principle, if not a rule of customary law, and it calls attention to the link between the precautionary approach and due diligence obligations.[38]

States also have obligations with respect to monitoring and environmental assessment as set out in UNCLOS, Articles 204–206. This was established in the *Pulp Mills on the River Uruguay* case, in which significant transboundary harm was shown,[39] and in the 2011 Advisory Opinion from the Seabed Disputes Chamber, as a general obligation under customary international law: "Environmental impact assessment ... should be included in the system of consultations and prior notifications set out in Article 142 of the Convention with respect to resource deposits in the area which lie across limits of national jurisdiction."[40]

Thus, it is necessary to examine, analyze, and assess the impact on the marine environment of land-based activities to ensure an appropriate implementation of the provisions. In addition, States have the duty of cooperating to prevent pollution of the marine environment, as it is a fundamental principle set out in Part XII of UNCLOS as well as in general international law (see, e.g., *MOX Plant [Ireland v. United Kingdom]*, Provisional Measures).[41] Furthermore, Article 235 of UNCLOS specifies the responsibility and liability of States for the protection of the marine environment.

Having reviewed the development of customary law and principles that comprise due diligence obligations, a precautionary approach, and the requirement of environment impact assessments

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[38] Günther Handl, *Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area: The International Tribunal of the Law of the Sea's Recent Contribution to International Environmental Law*, 20 Rev Eur Comm Int Env L 208, 210 (2011).

[39] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14, at 82 ¶ 204.

[40] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17 at 45 ¶ 148.

[41] The MOX Plant Case (*Ireland v. United Kingdom*), Provisional Measures, Order 2001/5 of November 13, 2001 [2001] ITLOS Case No. 10 at ¶ 82.

established in pertinent cases, it is difficult to exclude the applicability of land-based pollution to the sea under UNCLOS and customary laws. Rather, it is clear that States have obligations of due diligence to prevent land-based pollution to the seas and oceans that could bring about serious transboundary environmental harm.

3.4 *Philippines v. China* Case

The South China Sea Arbitration Award[42] revisits the obligation to protect the marine environment in submissions 11 and 12(b) in relation to China's violation of obligations to protect the marine environment under Articles 192 and 194 of UNCLOS. The Tribunal notes that "obligations in Part XII apply to all States with respect to the marine environment in all maritime areas, both inside the national jurisdiction of States and beyond it."

Regarding the "general obligation" in Article 192, the Tribunal considers that Article 192 imposes a duty on State parties, the content of which is informed by the other provisions of Part XII and other applicable rules of international law. With respect to the due diligence obligation, the Tribunal requires "due diligence," extends its approach, and requests the "high standard of due diligence more [as] a question of law"[43] in Part XII by adopting appropriate rules and measures, as well as a certain level of vigilance in the enforcement and exercise of administrative control.

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[42] In re Arbitration Between the Republic of the Philippines and the People's Republic of China, 2016 PCA Case No. 2013–19.

[43] Makane Moise Mbengue, *The South China Sea Arbitration: Innovations in Marine Environmental Fact-Finding and Due Diligence Obligations*, Symposium on the South China Sea Arbitration, 110 ASILL 285, 286 (2016).

3.5 Application of a Due Diligence Obligation

A due diligence obligation relates to the concept of "no harm" obligations under customary law, which have some flexibility from one case to another but should be "appropriate and proportional to the degree of risk of transboundary harm in the particular instance."[44] As stated above, these obligations are not necessarily "completely open ended"[45]: Article 194 of the UNCLOS (General Obligation to Prevent, Reduce, and Control Pollution of the Marine Environment) general provisions (in Part XII) appears to attempt to incorporate harmonized policies and regulations, as well as international perspectives, whereas Article 207 of UNCLOS imposes a particular obligation of land-based pollution control.

Having considered the two Advisory Opinions rendered by the ITLOS (cases 17[46] and 21[47]) as well as the *China v. Philippines* case,[48] it is concluded that the due diligence obligation can fill part of the gap resulting from the lack of implementation of Articles 207 to 213, which invite States to establish global and international rules to prevent, reduce, and control pollution from land-based sources and to prevent, reduce, and control marine pollution in general.

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[44] S. Jayakumar, Tommy Koh, Robert Beckman, Hao Duy Phan, eds., *Transboundary Pollution, Evolving Issues of International Law and Policy* ch.1 at 16 (Edward Elgar 2015).

[45] Elizabeth A. Kirk, *Science and the International Regulation of Marine Pollution* in Rothwell, Oude Elferink, Scott, and Stephens, eds., *The Oxford Handbook of the Law of the Sea,* ch. .23 at 522 (Oxford, 2015).

[46] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17.

[47] Request for an advisory opinion submitted by the Sub-Regional Fisheries Commission (SRFC), 2015 ITLOS Case 21.

[48] In re Arbitration Between the Republic of the Philippines and the People's Republic of China, 2016 PCA Case No. 2013–19.

4. Considerations of Other Legal Instruments and Principles

4.1 Regulation by Declarations and Regional Conventions

While UNCLOS may well represent the strongest compulsions for compliance, other tools such as regional conventions and declarations may often apply as implementing provisions. In the literature, one analysis first identifies limitations in the control of land-based pollution to the sea at the global level due to the discretion afforded individual States but then concludes that regional agreements can regulate land-based pollution, albeit as a non-binding apparatus.[49] The author of the article posited that, while UNCLOS provides a general and comprehensive framework for marine environment protection, including the prevention of land-based pollution advocated in Articles 194(1)/(2) and 201(1), the provisions are "too general to be very useful."[50]

Soft laws, such as UN declarations, may not have binding obligations but are considered international legal instruments, and there are several declarations that relate to marine pollution control. The first concerning the protection of the marine environment is the Stockholm Declaration of 1972.[51] Next, under the auspices of the United Nations Environment Programme (UNEP), the Montreal Guidelines for the Protection of the Marine Environment against Pollution from Land-Based Sources of 1985 drafted a declaration on the subject of land-based pollution of seas and oceans.[52] Although the guidelines are not binding, they did advance several measures that States were required to take into account. Publication of the *Report of the United Nations Conference on Environment and Development* (Rio de Janeiro, June 3–14,

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[49] Yoshifumi Tanaka, *Regulation of Land-Based Marine Pollution in International Law: A Comparative Analysis between Global and Regional Frameworks*, 66 Zeitschrift für ausländisches öffentliches Recht und Völkerrecht 535, 536–537 (2006).

[50] Yoshifumi Tanaka, *The International Law of the Sea*, 2nd ed., 279 (Cambridge, 2015).

[51] UN Doc. A/CONF.48/14/Rev.1 (1973), [*Stockholm Declaration*]

[52] UNEP Governing Council Decision 13/18/II, May 24,1985, 13th Governing Council Session; *Environmental Law*, in GAOR 40th Session Supp. No. 25 (A/40/25),
online: UNEP <http://www.unep.org/Documents.multilingual/Default.asp?DocumentID=59&ArticleID=427&l=en> [*Montreal Guidelines*].

1992) followed, which also refers to the protection of the oceans (see Chapter 17) and specifically mentions the protection of the marine environment from land-based activities.[53]

Subsequently, the Washington Declaration on Protection of the Marine Environment from Land-Based Activities (1995) was adopted by the representatives of governments and the European Commission participating in the "Intergovernmental Conference to Adopt a Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities" held in Washington, DC (October 23–November 3, 1995).[54] The resultant Global Programme of Action, in turn, established management regimes for administration by the UNEP as follows:

> (a) Review progress on implementation of the Programme of Action;
> (b) Review the results of scientific assessments regarding land-based impacts upon the marine environment provided by relevant scientific organizations and institutions;
> (c) Consider reports provided on national plans to implement the Programme of Action;
> (d) Review coordination and collaboration among organizations and institutions, regional and global, that have responsibilities and experience with respect to prevention, reduction, and control of impacts upon the marine environment from land-based activities;
> (e) Promote exchange of experience between regions;

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[53] "Protection of the Oceans, All Kinds of Seas, Including Enclosed and Semi-enclosed Seas, and Coastal Areas and the Protection, Rational Use and Development of their Living Resources" in *Report of the United Nations Conference on Environment and Development*, UN Doc. A/CONF.151/26 (Vol. II), August 13, 1992, agenda 21, chapter 17.

[54] *Washington Declaration on Protection of the Marine Environment from Land-Based Activities*, (November 1, 1995) [*Washington Declaration*].

(f) Review progress on capacity building ... and on mobilization of resources ... to support the implementation of the Programme of Action, in particular by countries in need of assistance and, where appropriate, provide guidance;
(g) Consider the need for international rules, as well as recommended practices and procedures, to further the objectives of the Programme of Action.[55]

There have been important developments after the Washington Declaration regarding the adoption of new declarations and action plans to protect the marine environment from land-based activities. The Montreal Declaration of the Protection of the Marine Environment from Land-Based Activities (2001) adopted "the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, to protect and preserve the marine environment from the impacts of land-based activities" in Montreal, Canada (November 26–30, 2001).[56]

At the World Summit on Sustainable Development in 2002, those in attendance resolved to advance the implementation of a global program;[57] approximately ten years later, following a further "Intergovernmental Review Meeting for the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities,"[58] which was held in Manila (January 25–26, 2012), the Manila Declaration[59] on Furthering the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities was adopted to focus on wastewater, nutrients, and

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[55] "Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities," UN Doc. UNEP(OCA)/LBA/IG.2/7 (December 5, 1995) at 31, ¶ 77 [Global Programme of Action].

[56] *Montreal Declaration on the Protection of the Maine Environment from Land-Based Activities*, UN Doc. UNEP/GCSS.VII/4/Add.4 (January 30, 2002), [*Montreal Declaration*], annex I at 8.

[57] "Plan of Implementation of the World Summit on Sustainable Development" in *Report of the World Summit on Sustainable Development*, UN Doc. A/CONF.199/20 (September 4, 2002), at Resolution 2, annex.

[58] See *Report of the Third Session of the Intergovernmental Review Meeting on the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities*, UN Doc. UNEP/GPA/IGR.3/6 (January 26, 2012), at 8, §Part Two: High-Level Segment, item IV (Adoption of the ministerial declaration).

[59] Id at 9, annex [*Manila Declaration*].

litter using global, multi-stakeholder partnerships between 2012 and 2016.[60] A resolution adopted by the UN General Assembly (UNGA) on December 29, 2014 called upon States to implement the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities.[61]

The adoption of these declarations and of the Global Programme of Action can be seen as signifying that control of land-based activities is accelerating and that many States are concerned about the impact of land-based pollution on the marine environment. However, there are also reservations concerning the effectiveness of these declarations, given that they are not binding on individual States. Furthermore, it has been noted—for example, in the Washington Declaration in 1995 and the Montreal Declaration in 2001—that the spread of land-based pollution to the sea is often closely linked to poverty issues in developing countries and that considerations should therefore be given to poverty-reduction measures to better protect the marine environment from pollution originating from land-based activities.[62]

4.2 Regional Sea Treaties and Programs

With this preference for soft regulations such as UN declarations and the potential difficulties of establishing detailed rules and regulations at the global level, the protection of the marine environment may instead largely depend on legally binding regional seas conventions and associated action plans at the local level. This approach also offers the prospect of applying more specific, detailed rules and requirements in accordance with the particular circumstances of individual regions. Historically, States have tended to pay scant attention to the transboundary

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[60] *Countries Adopt Manila Declaration to Strengthen Protection of Global Marine Environment* (UNEP News, January 27, 2012).

[61] UNGA Res. 69/245 (December 29, 2014), *Oceans and the Law of the Sea*, ¶¶ 190, 191, and 194.

[62] Tanaka, *The International Law of the Sea* at 281 (cited in note 50).

nature of land-based pollution in the seas; more recently, however, there has been increased awareness of the issue, particularly after areas such as the Baltic Sea have been confirmed to be contaminated as the consequences of actions taken by States along their coastlines.

Following the 1972 United Nations Conference on the Human Environment held in Stockholm, the UNEP Regional Seas Programme was launched in 1974; today, more than 143 countries participate in thirteen regional programs covering the Black Sea, the Wider Caribbean, East Asian Seas, Eastern Africa, South Asian Seas, the Regional Organization for the Protection of the Marine Environment (ROPME) Sea Area, the Mediterranean, the North-East Pacific, the Northwest Pacific, the Red Sea and Gulf of Aden, the South-East Pacific, the Pacific, and Western Africa. Similar independent agreements are in place for the Antarctic, Arctic, Baltic, Caspian, and North-East Atlantic regions.[63] The programs each function through action plans that are themselves underpinned by a regional convention and associated protocols on specific issues (e.g., marine pollution, dumping, hazardous and radioactive wastes); the action plans reflect each region's individual environmental challenges, as well as its socioeconomic and political circumstances.[64]

The starting point for regulating land-based pollution is to identify harmful substances, after which they must be categorized using "black" and "grey" lists based on the level of hazard they pose. This approach was used in the 1974 Paris Convention (Article 4)[65] and the 1974 Helsinki Convention (Articles 5 and 6),[66] for example. However, it was later concluded that this "black and grey list" approach could not prevent all harmful substances from polluting the marine environment, and it was thus replaced by a uniform approach, as articulated in the 1992 OSPAR

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[63] UNEP, *Regional Seas Programme* online: UNEP <http://www.unep.org/regionalseas/programmes/default.asp>.

[64] Id.

[65] *Convention for the Prevention of Marine Pollution from Land-Based Sources*, June 4, 1974, 1546 UNTS 119 (May 6, 1978), [*Paris Convention*].

[66] *Convention on the Protection of the Marine Environment of the Baltic Sea Area*, March 22, 1974, 1507 UNTS 167 (May 3, 1980), [*Helsinki Convention*].

Convention (Article 3)[67] and the 1992 Helsinki Convention,[68] for instance. In fact, all the regional conventions presented in Table 1 have specific provisions for controlling land-based sources of pollution. For example, the Barcelona Convention clearly states that parties of the Convention "shall take all appropriate measures to prevent, abate, combat, and control pollution of the Mediterranean Sea Area caused by discharges from rivers, coastal establishments, or outfalls, or emanating from any other land-based sources within their territories" (Article 8),[69] and a similar resolution features in Article 3 of the OSPAR Convention.[70]

Prior to the 2011 Advisory Opinion,[71] precautionary approaches were not frequently taken at international levels. Indeed, this approach was considered a controversial aspect of international environmental law, as its legal status or the requirement to apply it is directed by local courts and tribunals.[72] However, contrary to this modest approach found in customary law, as an important principle and obligation, the precautionary approach does feature in some regional conventions such as the OSPAR Convention (Article 2)[73] and the 1992 Helsinki Convention (Article 3(2)).[74] While its application is still thought to cause tension between environmental protection and economic development for some regions, it is recognized as a useful

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[67] *Convention for the Protection of the Marine Environment of the North-East Atlantic*, September 22, 1992 (March 25, 1998), [*OSPAR Convention*].

[68] *Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992*, April 9, 1992 (January 17, 2000), [*1992 Helsinki Convention*].

[69] *Convention for the Protection of the Mediterranean Sea against Pollution*, February 16, 1976, 1102 UNTS 44 (February 12, 1976), [*Barcelona Convention*].

[70] *Convention for the Protection of the Marine Environment of the North-East Atlantic*, September 22, 1992 (entered into force March 25, 1998), [*OSPAR Convention*].

[71] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17 at 39–41 ¶ 125–135.

[72] Duncan French, *From the Depths: Rich Pickings of Principles of Sustainable Development and General International Law on the Ocean Floor – the Seabed Disputes Chamber's 2011 Advisory Opinion*, 26 Int J Marine & Coastal L 525, 549, (2011).

[73] *Convention for the Protection of the Marine Environment of the North-East Atlantic*, September 22, 1992 (entered into force March 25, 1998), [*OSPAR Convention*].

[74] *Convention on the Protection of the Marine Environment of the Baltic Sea Area*, March 22, 1974, 1507 UNTS 167 (May 3, 1980), [*Helsinki Convention*].

implementation measure for pollution control through regional conventions, alongside reporting systems and environmental impact assessments.

The UNEP-established Global Programme of Action also endeavors to prevent "the degradation of the marine environment from land-based activities by facilitating the realization of the duty of States to preserve and protect the marine environment."[75] The program also emphasizes regional, national, and international cooperation with regional conventions and action plans. More recently, the draft program of work for the period 2018–2022 was prepared to enhance cooperation through Regional Seas programmes and strengthen the implementation of the Global Programme of Action to mitigate land-based marine pollution.[76] Regional conventions and global intergovernmental mechanisms can supplement the implementation of UNCLOS and the due diligence obligations to prevent significant transboundary harm from land-based pollution.

4.3 Precautionary Approach

Principle 15 of the Rio Declaration[77] codified the precautionary approach for the first time and stated that a lack of scientific certainty shall not be used as a reason to postpone action to prevent environmental degradation. The core of this principle is anticipation, as States should act carefully considering possible adverse impacts on the environment; more narrowly, activities that may be harmful to the environment should be regulated and possibly prohibited, even if no

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[75] UNEP, "Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities," UN Doc. UNEP(OCA)/LBA/IG.2/7 (December 5, 1995) at 7, ¶ 3.

[76] UNEP/GPA/IGR.4/4, Intergovernmental Review Meeting on the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities Fourth session, Bali, Indonesia,31 October-1 November 2018, Programme of work of the Global Programme of Action Coordination Office for the period 2018–2022 https://papersmart.unon.org/igr-meeting/sites/default/files/draft_programme_of_work_gpa-igr-4_rev_1.pdf

[77] UN Doc. A/CONF.151/26 (Vol. I), (UN, August 12, 1992) [*Rio Declaration*] at annex I.

conclusive evidence is available.[78]

Although the incorporation of the precautionary approach can be found in treaties such as the Convention on Biological Diversity and the Convention on Climate Change, the precautionary approach/principle has been used in case law, and there has been a discussion on whether it has become a principle of international law. Indeed, the precautionary approach has been considered a controversial aspect of international environmental law, with its legal status—and the requirement to apply it—directed by local courts and tribunals.[79]

On a few occasions, ITLOS notes that States must "act with prudence and caution" to protect the environment (ITLOS Case Nos. 3 and 4, Order of 27 August 1999, Southern Bluefin tuna, Para 77 and the Advisory Opinion, Responsibilities and Obligations of States sponsoring Persons and Entities with respect to Activities in the Area (Case 17),[80] (February 1, 2011). In the case of the South China Sea Arbitration,[81] there was no reference to the precautionary approach in the Award, although the Philippines claimed that China was obliged to apply the precautionary approach.

Regarding land-based pollution to the sea, having examined the definition of the Rio declaration and the above cases, it is possible to argue that the precautionary approach would apply if pollution could lead to irreversible harm, particularly in the case of land-based pollution. More importantly, the approach could be applied more widely; that is, States should take

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[78] Commission on Sustainable Development, *Report of the Expert Group Meeting on Identification of Principles of International Law for Sustainable Development*, Geneva, Switzerland, September 26–28, 1995.

[79] Duncan French, "From the Depths: Rich Pickings of Principles of Sustainable Development and General International Law on the Ocean Floor – the Seabed Disputes Chamber's 2011 Advisory Opinion" (2011) 26 The International Journal of Marine and Coastal Law 525 at 549.

[80] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17.

[81] In re Arbitration Between the Republic of the Philippines and the People's Republic of China, 2016 PCA Case No. 2013–19.

precautionary measures to prevent and protect the marine environment in general.

4.4 National Sovereignty Constraints

Because of national sovereignty over land-based activities, significant challenges exist in creating international legal frameworks to control marine pollution from land-based activities. For example, the imposition of international nuclear safety requirements could prove difficult because such actions might appear to infringe upon national sovereignty.[82] Furthermore, the control of land-based activities can have direct social and economic impacts; thus, it becomes a challenge for some States to exercise strict control under an international legal framework. States still have the obligation to refrain from harming other States, as established in the Rio Declaration (Principle 2).[83] They also have general due diligence obligations under UNCLOS (Article 194)[84] and direct obligations as set out in the ITLOS Advisory Opinion[85] as well as by the South China Sea Award.[86]

Moreover, this limitation is consistent with the decision in the *Trail Smelter* transboundary pollution case[87] discussed above: "States must not permit their nationals to discharge into the sea matter that could cause harm to the nationals of other States."[88] Awareness should be maintained not only of the impact on neighboring countries but also on the global marine

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[82] Norbert Pelzer, *Safer Nuclear Energy through a Higher Degree of Internationalization? International Involvement versus National Sovereignty*, 91 Nuclear L Bull 43, 63 (2013).

[83] UN Doc. A/CONF.151/26 (Vol. I), August 12, 1992, [*Rio Declaration*] at annex I.

[84] December 10, 1982, 1833 UNTS 3 (entered into force November 16, 1994) [UNCLOS].

[85] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area *(Advisory Opinion on Seabed Activities),* 2011, ITLOS Case 17.

[86] In re Arbitration Between the Republic of the Philippines and the People's Republic of China, 2016 PCA Case No. 2013–19.

[87] Trail Smelter case (*United States v. Canada),* 1938 and 1941, 3 RIAA 1905, 1965.

[88] Churchill. *The Law of the Sea* 332 (cited in note 24).

environment if contaminated water is released from the land into the sea. Finding a balance among national sovereignty, marine environmental protection, and economic impacts is clearly essential to resolving this issue.

5. Conclusion and the Future of Land-Based Pollution Control

5.1 Legal Framework – UNCLOS and Due Diligence Obligations

It may be difficult to strike an effective balance between environmental protection and economic, political, and social considerations. For example, environmental protection may be less emphasized in some countries depending on their economic situations. Many States may also prefer to prioritize economic and political elements over marine environmental protection. However, under the right framework, economic development need not be overridden by environmental and safety concerns in the long term.

Many prior studies are hesitant to apply the provisions of UNCLOS, and specifically those of the London Convention and London Protocol, because "land-based sources" is missing from the definition of "dumping," and significant discretionary power is given to States under Articles 192, 194, and 207 of UNCLOS. One has suggested that, in terms of improving existing international frameworks, it may be necessary to adopt a treaty to control land-based pollution to sea based on the framework established in the London Convention and the London Protocol. [89]

However, as observed above, States have certain obligations to prevent marine pollution from land-based sources under Part XII of UNCLOS and customary law. Indeed, having reviewed

[89] Darian Ghorbi, *There's Something in the Water: The Inadequacy of International Anti-Dumping Laws as Applied to the Fukushima Daiichi Radioactive Water Discharge,* 27 Am U Int L Review 473, 501 (2012).

the development of customary law, as well as the principles established in pertinent cases such as due diligence obligations and the precautionary approach, it is difficult to deny the applicability of land-based pollution to the sea, all of which falls under UNCLOS and customary law.

Rather, States have obligations of due diligence to prevent the spread of land-based pollution to the seas and oceans that could cause serious transboundary environmental harm. As observed above, UNCLOS includes provisions imposing general and specific obligations, and is not expected to have detailed provisions for each case to which it might apply. Consequently, States have certain obligations to prevent marine pollution from land-based sources under Part XII of UNCLOS and customary law, and due diligence obligations could fill part of the gap resulting from the lack of implementation of Articles 207 and 213 of UNCLOS, as well as of Articles 194 and 207.

5.2 Acceleration of Soft-Law Approach and Regional Cooperation

This chapter demonstrates that it is necessary to consider the apparently conflicting demands of economic activities within a State, national sovereignty, and the principles of State responsibilities and obligations regarding marine environmental protection. Thus, controlling the spread of land-based pollution to the sea is a complex issue because these economic, political, and social elements will differ from country to country and between international and regional levels. Despite these difficulties, however, several declarations pertaining to land-based pollution to the sea have been adopted to date at the UN level.

Indeed, considering the extensive procedural and political complexities of adopting amendments to international conventions, a soft law approach through the adoption of international declarations may prove more practical, at least to a certain degree. Such laws may

not have the power to enforce States' compliance, but this could lead to a strict legal approach with an equally strict obligation in the long term.[90] For the purposes of this paper, a common understanding embedded in declarations and discussion of these issues in relation to adopting a particular declaration may also have a strong impact on improving approaches toward land-based pollution to the sea. In this sense, declarations would still be useful international legal instruments.

Regional conventions are evidently important legal instruments from a practical perspective in terms of preventing the release of contaminated water from the land to the sea. Under UNEP, in conjunction with action plans and declarations pertaining to land-based pollution control, many regional conventions have been adopted and entered into force. Neighboring countries have corresponding interests in protecting the seas in their region, and the activities and their control will directly impact local economic activities, as well as the wider marine environment.

Given that many regional conventions already exist in terms of the protection of the marine environment from land-based sources of pollution, the creation of a relevant regional convention for each region specific to its location and particular concerns may be an effective solution. For example, such conventions may accelerate the prevention of the release of radioactive contaminated water from the land to the sea in the East Asian Seas and Northwest Pacific. In particular, with reference to States in these regions that use and/or plan to use a nuclear power plant and therefore may have cause to release contaminated radioactive water in these regions in the future, it would be beneficial to implement such conventions before another nuclear accident occurs, even with the potential conflicting demands of associated economic activities, since pollution will negatively affect those in the future as well.

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[90] Pelzer, *Safer Nuclear Energy through a Higher Degree of Internationalization? International Involvement versus National Sovereignty*, 68 (cited in note 85).

In earlier cases in which radioactive waste was dumped from ships, an international agreement did not stop such activity; instead, the US stopped dumping in 1970 following the publication of a report stating that radioactive waste dumping at sea was not economical compared with other forms of disposal,[91] while Japan changed its plans to dispose of radioactive wastes in the Pacific only after protests by the island nations near the disposal sites. Moreover, the process of harmonization between economic development and environmental protection can form the basis of "sustainable development."

In addition to regional conventions, judiciously constructed regional action plans may beneficially incorporate technical cooperation programs to aid in the delivery of broader environmental protection. Political and economic aspects will have some influence, but a cooperation program such as the one proposed here should focus on environmental requirements and responsibilities, as all States will benefit from the results of marine environmental protection. Accepted guiding principles, such as the "polluter pays" principle (under which the costs of preventing or remediating pollution are generally imposed on the polluter and not on the victims of such pollution or society), utilizing the best available technology and corroborated environmental practices, and, where appropriate, endorsing clean technology should be applied, as already occurs under other regional conventions such as the 1992 Helsinki Convention (Article 3(3)/(4).[92]

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[91] Spak, *The Need for a Ban on All Radioactive Waste Disposal in the Ocean*, 819 (cited in note 25).

[92] *Convention on the Protection of the Marine Environment of the Baltic Sea Area*, March 22, 1974, 1507 UNTS 167 (May 3, 1980), [*Helsinki Convention*].

Chapter 4 Due Diligence Obligations and Transboundary Environmental Harm: Cybersecurity Applications

1. Introduction

1.1 Issues Regarding International Watercourses and Cybersecurity

Certain activities are increasingly borderless. For example, the unreasonable and equitable use of river water in an upstream country may negatively impact the water quality in downstream countries. The level of regulation of the cyber system in one State may be a threat to international peace and security due to cyberattacks. Watercourses and cybersecurity are among the most pressing issues requiring international cooperation to prevent transboundary harm, which may take diverse forms in terms of wrongdoers, wrongful acts, damage, and attribution.

However, until recently, there were limitations and uncertainties surrounding the standard of due diligence and the application of State responsibility in the areas of international watercourses because there were few related cases or prior studies. Recently, opportunities to clarify and consolidate the concepts underlying the due diligence standard have been presented at ICJ in the area of international watercourses: *Pulp Mills* [1] and *Costa Rica v. Nicaragua/Nicaragua v. Costa Rica.*[2]

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[1] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14.

[2] Case concerning Certain Activities Carried Out by Nicaragua in the Border Area. (*Costa Rica v. Nicaragua*) and Construction of a Road in Costa Rica along the San Juan River (*Nicaragua v. Costa Rica*), 2015, ICJ Rep. 665, and Certain Activities Carried out by Nicaragua in the Border Area (*Costa Rica v. Nicar.*), Compensation Owed by the Republic of Nicaragua to the Republic of Costa Rica, General List No. 150, at para. 42 (Int'l Ct. Just. Feb. 2, 2018) (Question of Compensation).

Since cybercrime tends to be global in nature, it requires a global legal regime. Public international law plays an essential role in regulating activities in cyberspace.[3] However, States take different positions on whether cyberspace is a new area that requires new law. In the areas of cybersecurity, there are few international treaties in terms of States' rights and duties. Indeed, the field of international cybersecurity law remains relatively immature; States have not yet developed international law to protect essential infrastructure despite the widespread policy emphasis on cybersecurity protection.[4]

The exception to this is the Convention on Cybercrime (the Budapest Convention),[5] which is the first—and currently the only—binding international legal instrument on crimes committed via the Internet and other computer networks. Its objective is "to pursue, as a matter of priority, a common criminal policy aimed at the protection of society against cybercrime, *inter alia*, by adopting appropriate legislation and fostering international cooperation."[6] While fifty-nine States have ratified it,[7] China, a non-party of the Budapest Convention, claimed that the State parties would not be willing to share sensitive information.[8]

Cooperative efforts may be limited to agreements among politically aligned States.[9] The UN Group of Governmental Experts on Developments in the Field of Information and Telecommunications in the Context of International Security (UNGGE) identifies the voluntary,

3 Kriangsak Kittichaisaree, 2017. Public International Law of Cyberspace. 336 (Springer, 2017).

4 ILA Study Group on International Law and Cyberterrorism, Study Group Report, at 69 (2016), available at http://cyberregstrategies.com/wp-content/uploads/2017/03/ILA_SG_Cyber_Terrorism_FINAL_REPORT.pdf

5 The Convention on Cybercrime of the Council of Europe (CETS No. 185) (2001).

6 Ibid. Preamble.

7 Chart of signatures and ratifications of Treaty 185, Convention on Cybercrime, Status as June 16, 2018 available at https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/185/signatures (accessed on June 16, 2018).

8 Kittichaisaree, 2017. Public International Law of Cyberspace, at 292 (cited in note 4).

9 Ian Yuying Liu. *State responsibility and cyberattacks: Defining due diligence obligations* 4 , The Indonesian J Int and Comparative L 191, 222 (2017).

nonbinding norms[10] for responsible State behavior to create an international code of conduct for information security. The Tallinn Manual[11] is based on a Euro–Atlantic consensus on law in cyberspace and has not been widely adopted by the international community.[12] The United States and China signed a bilateral agreement in 2015 concerning economic espionage, reflecting a trend in bilateral and regional implementation that may be more effective in terms of immediacy than for developing an international agreement.

1.2 Modality of State Responsibilities

The modality of State responsibilities under due diligence obligations may respond to the current limitations of internationally agreed-upon law to prevent significant transboundary harm in the area of cybersecurity. In this regard, procedural duties may be an important factor when examining the concept of due diligence in cyberoperations and clarifying its role under customary international law.

In this Chapter, the thesis first elucidates the procedural duties of due diligence, the significance of which was explicated in Chapter 3, in the context of international watercourses to clarify and consolidate the concepts underlying the due diligence standard. The thesis then discusses the notion of due diligence as an important tool not only for dealing with traditional environmental issues, but also for responding to cybersecurity, considering that few international treaties exist

10 UN General Assembly, A/70/174, Developments in the field of information and telecommunications in the context of international security, *Group of Governmental Experts on Developments in the Field of Information and Telecommunications in the Context of International Security* (2015), at 7 ¶9, http://undocs.org/A/70/174

11 Michael N. Schmitt, and Liis Vihul, eds. *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations* 13 (Cambridge 2017).

12 Keir Giles *Prospects for the Rule of Law in Cyberspace. Carlisle*: Strategic Studies Institute and U.S.14 (Army War College, 2017).

in terms of the rights and duties of States in this arena.[13] Next, the thesis analyzes and proposes procedural duties in cyberspace. Finally, the thesis raises concerns related to the possible application of due diligence to the private sector, due to the crucial role of the private sector in cybersecurity, and actions that the principle of due diligence would require States to take to prevent harmful acts arising from the private sector in light of its significance in protecting cybersecurity.

2. Procedural Duties in Due Diligence Obligations

2.1 Emergence of Procedural Duties

Procedural duties may be an important factor in clarifying the role of due diligence in cyberoperations under customary international law. This is because procedural duties can lead to a more objective, coherent, and stable interpretation. In the *Pulp Mills* case, which was an international watercourse dispute between Uruguay and Argentina regarding the potential and actual environmental harm caused by the construction and operation of pulp mills located near a mutual river, the court confirms that procedural obligations are an integrated and indivisible whole, and that procedural obligations exist separately from substantial obligations.[14] The Court also confirms that the principle of prevention is a customary rule and the prevention principle requires the obligation of cooperation and obligation to conduct environmental assessments.

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[13] Taddeo, Mariarosaria, and Ludovica Glorioso, eds. *Ethics and Policies for Cyber Operations: A NATO Cooperative Cyber Defence Centre of Excellence Initiative*. 117 (Springer 2017).

[14] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay*), 2010 ICJ Rep 14.

Procedural duty has the potential to strengthen the prevention of the transboundary harm principle, which supports the due diligence standard.[15] The ICJ indicates that the establishment of laws to prevent environmental harm is, of itself, insufficient to exercise a standard of due diligence.[16] Furthermore, the Court elaborates the due diligence requirement comprising the duty to prevent harm in "good faith" when conducting a negotiation.[17] Consequently, the Court holds that Uruguay breached the requirement to perform its procedural obligations.[18]

2.2 Cooperation, Notification, and Consultation

The "duty to cooperate" is an essential procedural duty that includes the duty to notify and consult with the concerned States, the obligation to conduct an environmental impact assessment (EIA), and the principle of prior informed consent. The first step in the process of cooperation to prevent transboundary harm is the exchange of scientific data and information to protect the environment and ecosystems. States have the duty to notify neighboring States as soon as a plan of construction is received and then to send a more detailed notification to neighboring States based on an EIA.[19] ICJ finds that EIAs play a pivotal role in relation to notification; thus, conducting a transboundary EIA is an essential and independent obligation in international law in cases in which significant transboundary harm is a threat.[20] In relation to the scope and the content of EIAs, the Court indicates that States have the discretionary power to make the decision, subject to the requirement to exercise due diligence in conducting such an assessment.[21]

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[15] Jutta Brunnée, *Procedure and substance in international environmental law: Confused at a higher level?*, 5 Eur Soc Int L Issue 6 (2016) https://esil-sedi.eu/?p=1344

[16] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14, 105 at ¶197.

[17] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14,105 at ¶ 278

[18] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14,83 at ¶ 157,158, 268

[19] Owen McIntyre, *The World Court's Ongoing Contribution to International Water Law: The Pulp Mills Case between Argentina and Uruguay*, 4 *Water Alternatives* 122, 140 (2011).

[20] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14,83 at ¶ 205.

[21] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14,83 at ¶ 205.

Following such a development, that is, procedural obligations that are an integrated and indivisible whole, the ICJ did not, however, adopt "a progressive approach"[22] in its understanding of the due diligence obligation, owing to the risk of triggering an EIA obligation. Indeed, the court left the question of EIA legal status under international law open.[23] In *Costa Rica v. Nicaragua,*[24] the Republic of Costa Rica filed an application initiating proceedings against the Republic of Nicaragua, alleging that Nicaragua invaded and occupied the Costa Rican territory, that it dug a channel thereon, and that it conducted works (notably dredging of the San Juan River) in violation of its international obligations. The Court concluded that Nicaragua was not required to notify or consult with Costa Rica because it was not under an obligation to conduct an EIA, given the absence of a risk of significant transboundary harm.[25] Therefore, the criteria for "absence of risk" may be key in terms of the obligation to conduct an EIA under procedural obligations of due diligence duties.

2.3 International Water Conventions

The importance of procedural law is also obvious in some provisions of the Convention on the Law of the Non-navigational Uses of International Watercourses (the UN Watercourse Convention, or UNWC), including Part II—General Principles, Article 8—General Obligation to Cooperate, and Article 9—Regular Exchange of Data and Information.[26] The UNWC procedural mechanism allows a reasonable waiting period before undertaking activities, although one State may not be capable of stopping the activities of another. Indeed, the provisions of UNWC are important because they value the procedural obligations in customary

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[22] Brunnée, *Procedure and substance in international environmental law: Confused at a higher level?* (cited in note 17)

[23] Yotova, R. *The Principles of Due Diligence and Prevention*, 75 Int J L 3, (2016).

[24] Case concerning Certain Activities Carried Out by Nicaragua in the Border Area. (*Costa Rica v. Nicaragua*) and Construction of a Road in Costa Rica along the San Juan River (*Nicaragua v. Costa Rica*), 2015, ICJ Rep. 665

[25] Ibid.

[26] The Convention on the Law of the Non-Navigational Uses of International Watercourses adopted by the General Assembly of the United Nations (May 21, 1997).

international law and codify them as such.

In relation to the exchange of information, Principle 9 of the Rio Declaration 1992[27] and the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention) Article 13 (Exchange of Information between Riparian Parties)[28] indicate the conditions, emissions, permits, regulations, and measures of the exchange, and state that information should be readily available, useful, and comprehensible. The notification is described in Rio Principle 19; Stockholm Declaration 51(b)(i), UNECE Conv. Article 9(2)(h), UNWC Articles. 11–19 (Part III: Planned Measures). Notifications must be sent within a reasonable time to allow for a response. Thus, the importance of the exchange of information and notification is recognized, and the framework is indicated in the cases and conventions.

3. Due Diligence in Cyberspace

3.1 Cybersecurity

States, entities, and individuals use computers, information, and communication technologies (ICT) heavily, and ICT are central to modern society.[29] Cybersecurity is high on the agenda for all sectors, and cyber risks present critical strategic challenges for leaders.[30] After the Sony hack in 2014,[31] cyberattacks were declared a "national emergency" in the United States in January 2015; this was followed by another incident in which Russia may have hacked the US

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[27] UN Doc. Rio Declaration, A/CONF.151/26 (August 12, 1992) at annex I.

[28] The Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention), adopted in Helsinki (March 17, 1992), the United Nations Economic Commission for Europe.

[29] Oren Gross, *Cyber Responsibility to Protect: Legal Obligations of States Directly Affected by Cyber-Incidents*. Cornell Intl L J 48, 481, 481 (2015).

[30] World Economic Forum, *Advancing Cyber Resilience: Principles and Tools for Boards*, 4 (2017).

[31] Clare Sullivan. *The 2014 Sony Hack and the Role of International Law*. 8 J Natl Security L & Pol 437, 467 (2016).

election in 2016.[32] As these incidents show, cyberattacks are a threat to international peace and security.[33]

The number of cyberattacks against States is increasing, and such attacks are becoming more sophisticated.[34] In addition to cyberattacks, cyberespionage and cyberwarfare are also cybercrimes. While cyberattacks and cyberespionage may be intentional, cybersecurity incidents may occur unintentionally as a result of human error.[35] These cyberspace incidents are not controlled by effective and specific treaty-based rules because States and non-State actors tend not to regulate their behavior to take advantage of such situations.[36] In addition, cyberspace poses a difficulty for the establishment of agreeable international treaties owing to the specific technical features of ICT, including rapid technical development, as well as technical gaps between States.[37]

3.2 Attribution

States generally have responsibilities only if conduct that is attributed to a State constitutes a breach of one of its international obligations, because attribution establishes a nexus between an act through a physical person and the State.[38] Attribution is a complicated issue in general and is more demanding regarding cyberspace because of anonymity, the possibility of

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[32] Fidler, David. *The U.S. Election Hacks, Cybersecurity, and International Law*. 110 Articles by Maurer Faculty 337, 337, (2017).

[33] Joanna Kulesza. *State Responsibility for Cyber-Attacks on International Peace and Security*. 29 Polish Yearbook Int L 139, 151(2009).

[34] BIICL, *State Responsibility for Cyber Operations: International Law Issues*, Event Report, 1(2014). https://www.biicl.org/documents/380_biicl_report_-_State_FFresponsibility_for_cyber_operations_-_9_october_2014.pdf?showdocument=1

[35] Gross, *Cyber Responsibility to Protect: Legal Obligations of States Directly Affected by Cyber-Incidents*, at 484 (cited in note 34).

[36] Andreas Zimmermann, *International Law and "Cyber Space," 3* Eur Soc Int L Issue 1 at 2 (2014)

[37] Id at 2

[38] BIICL, *State Responsibility for Cyber Operations: International Law Issues*, at 2 (Cited in note 23)

multistage action (different persons, places, and jurisdictions), and the speed of operation.[39] Here, the modality of State responsibilities under due diligence obligations can answer such challenges; [40] States are responsible for cyberattacks originating within their sovereign territories under strict liability as an accepted norm in customary international law, as an alternative choice.[41]

A further extension of this theory may be possible; even transiting States whose cyberinfrastructure is being used in their territories for malicious cyber conduct have an obligation to prevent their territories from being used by referencing the ICJ *Nicaragua* case,[42] in which Nicaragua's territory was used as a trafficking route for military equipment.[43] However, one challenge in cyberspace is the extreme difficulty, or impossibility, of identifying the source when it is malicious,[44] while it is contrarily claimed that the attribution of malicious actions is becoming increasingly possible for the few countries that possess advanced technologies such as forensic investigation and high-level national intelligence programs.[45]

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[39] Id.

[40] Jason Jolley, D. 2017. *Attribution, State Responsibility, and the Duty to Prevent Malicious Cyber-Attacks in International Law*. PhD thesis, University of Glasgow, Glasgow, UK, at 210, Available online: https://ssrn.com/abstract=3056832 (accessed on October 11, 2018).

[41] Id at 212.

[42] *Military and Paramilitary Activities in and against Nicaragua* (*Nicaragua v. United States of America*) (Merits) ICJ Rep. 14, ¶ 157, (1986).

[43] Russel Buchan, *Cyberspace, non-State actors and the obligation to prevent transboundary harm*. 21 J Conflict & Security L 429, 434(2016).

[44] Gross, *Cyber Responsibility to Protect: Legal Obligations of States Directly Affected by Cyber-Incidents*, at 505 (cited in note 34).

[45] James Lewis. *Report of the International Security Cyber Issues Workshop Series*. Working Paper. UNIDIR, CSIS at 14 (2016)

3.3 Cyber-Diligence

States have a due diligence obligation to refrain from knowingly allowing their territories to be used for internationally wrongful acts using ICT,[46] and States should have the obligation to prevent cyberattacks from originating within their borders.[47] Rule 6 of the Tallinn Manual 2.0, as prepared by the International Group of Experts at the invitation of the NATO Cooperative Cyber Defence Centre of Excellence, indicates that the due diligence principle can apply to cyberoperations.[48] However, the manual does not clearly specify the kinds of actions that drive the due diligence principle.[49] Unlike real-world cases such as the prohibition of chemical weapons or the discharge of harmful substances under environmental law, it may be difficult and complicated to prohibit the use of cyberweapons under international law owing to certain technical challenges and verification hurdles.[50]

It is not clear which actions the principle of due diligence would require States to take in terms of their cyber infrastructure, cyber activity, and engaging in cyber activities. Despite the global connectivity of the Internet, cyberspace is no longer seen as a unique space, and national law applies to cyber infrastructure and activities within its territory.[51] However, when the principle applies to cybersecurity, specific obligations may be required owing to the lack of internationally established law.

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[46] UN, General Assembly, A/70/174, Group of Governmental Experts on Developments in the Field of Information and Telecommunications in the Context of International Security, at 8 ¶ 13(c) (cited in note 11)

[47] Liu, *State responsibility and cyberattacks: Defining due diligence obligations,* at 194 (cited in note 10).

[48] Schmitt. eds. Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations. 30 (cited in note 12).

[49] Olivia Hankinson, *Due diligence and the gray zones of international cyberspace laws*. 39 *MJIL* (2017). http://www.mjilonline.org/due-diligence-and-the-gray-zones-of-international-cyberspace-laws/

[50] Scott J. Shackelford, *Managing Cyber Attacks in International Law, Business, and Relations: In Search of Cyber Peace*. 271 (Cambridge, 2014).

[51] Schmitt. eds. *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations*. 13 (cited in note 12).

Moreover, unique features exist in the areas of cybersecurity: the wrongdoer is often unknown, and it is difficult to identify those responsible because of the anonymity of cyberattacks. Wrongful acts are highly likely to be intentional human actions in cases of cyberattacks, while there is a possibility of unintentional human conduct in cases of system errors. Cybersecurity damage can result in personal data theft and damage to systems. Consequently, the concept of due diligence in environmental law and the law of the sea may not be directly applicable to cybersecurity.[52] In addition, cyberspace contains higher risks than environmental cases because of its connectivity and global nature.

3.4 Preventive Action (Monitoring)

A note from the UN Group of Governmental Experts (GGE) indicates the importance of procedural obligations to prevent harm and encourages States to cooperate "to mitigate malicious ICT activity emanating from their territory."[53] States may be expected to discharge their due diligence obligations and implement a defense system for cybersecurity incidents. In the area of the environment, due diligence obligations demand the monitoring of activity implementation, namely, the "exercise of administrative control applicable to public and private operators, such as the monitoring of activities undertaken by such operators."[54] In the same manner, States also have an obligation to monitor cyber activities in their territories.[55] Indeed, States' duties to improve their monitoring of the Internet in their respective territories is triggered by the State sovereignty principle.[56]

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[52] Liu, *State responsibility and cyberattacks: Defining due diligence obligations,* at 206–213 (cited in note 10).

[53] UN, General Assembly, A/70/174, Group of Governmental Experts on Developments in the Field of Information and Telecommunications in the Context of International Security, at 10 ¶ 17(e) (cited in note 11)

[54] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14, 79 at ¶ 197.

[55] Bannelier-Christakis, K. *Cyber Diligence: A Low-Intensity Due Diligence Principle for Low-Intensity Cyber Operations?* 14 Baltic Yearbook of International Law 23, 30 (2015).

[56] Jason, *Attribution, State Responsibility, and the Duty to Prevent Malicious Cyber-Attacks in International Law,* at 150 (cited in note 45).

A monitoring system may be included to produce warnings against cyber threats and security incidents,[57] in addition to monitoring all activities in the network across a State's territory. Several monitoring systems such as the International Atomic Energy Agency (IAEA)[58] exist on an international level to safeguard against threats in different areas and have achieved some successes. Other examples could include an international monitoring system, 24-hour/7 days monitoring conducted with other authorities over cyber threats under bilateral or multilateral agreements, on a voluntary basis as cooperation or managed by an international organization on the basis of a treaty. Collaboration with relevant stakeholders, including international organizations, may be particularly required for those that lack technical and financial capabilities.[59]

While monitoring may lead to privacy concerns, the UN General Assembly asserts that States are also under an obligation to respect the right to privacy when monitoring activities.[60] In addition, States have an obligation to stay informed about cyberattack threats occurring in their territories.[61] Early warning systems against cyberattack threats may supplement such a monitoring system as a procedural duty. According to Article 5 of the Prevention of Transboundary Harm from Hazardous Activities 2001,[62] States "shall take the necessary legislative, administrative, or other action including the establishment of suitable monitoring mechanisms." Indeed, monitoring may be an effective measure because firewalls and antivirus

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[57] Gross, *Cyber Responsibility to Protect: Legal Obligations of States Directly Affected by Cyber-Incidents*, at 501 (cited in note 34).

[58] Convention on Early Notification of a Nuclear Accident, adopted by the UN General Conference in its special session, September 24–26, 1986, and opened for signature at Vienna on September 26, 1986 and at New York on October 6, 1986. This Convention establishes a notification system for nuclear accidents from which a release of radioactive material occurs or is likely to occur and which has resulted or may result in an international transboundary release that could be of radiological safety significance for another State.

[59] Buchan, *Cyberspace, non-state actors and the obligation to prevent transboundary harm,* at 452 (cited in note 48).

[60] UN Doc A/RES/68/167: "*The Right to Privacy in the Digital Age"* (December 18, 2013)

[61] Buchan, *Cyberspace, non-state actors and the obligation to prevent transboundary harm,* at 441 (cited in note 48).

[62] Draft articles on Prevention of Transboundary Harm from Hazardous Activities, with commentaries, UN 2001.

programs (traditional forms of security) may no longer be sufficient to prevent advanced cyber threats.

3.5 Impact Assessments

Because of the connectivity, anonymity, and global nature of cyberspace, it involves a higher risk of transboundary harm than international watercourses or law of the sea. However, there has been no development in the discussion of impact assessments as they apply to cyberspace. Without an EIA, it is difficult to judge whether States fulfill their due diligence obligations in terms of (preventing) transboundary harm. Thus, all States should conduct impact assessments to prevent significant transboundary harm as it applies to cybersecurity as a part of due diligence obligations.

The recent decision in the area of the environment regarding the *Costa Rica v. Nicaragua*[63] case confirmed that in the absence of significant harm an EIA is not required. If this also applies to cybersecurity, it may prove too late to prevent a large scale cyberattack, because the speed and scope of the harm would be much faster and broader. Consequently, the standard established in *Pulp Mills* may be desirable, in which EIA must be conducted prior to the project and States are requested to monitor effects on the environment during the project.[64] The failure to conduct an EIA and an action amounting to a lack of due diligence would constitute a violation of the duty to prevent harm.

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[63] Case concerning Certain Activities Carried Out by Nicaragua in the Border Area. (*Costa Rica v. Nicaragua*) and Construction of a Road in Costa Rica along the San Juan River (*Nicaragua v. Costa Rica*), 2015, ICJ Rep. 665

[64] Case concerning Pulp Mills on the River Uruguay *(Argentina v. Uruguay)*, 2010 ICJ Rep 14, 83–84 at ¶ 205.

3.6 Information Sharing

As discussed, information sharing is an important procedural obligation of the due diligence principle. The issue lies in establishing the kinds of information (including intelligence and details about crimes) that must be shared, and at which stage such information is required to be exchanged. In general, information sharing is the first step toward cooperation. However, national security concerns can impose limitations on information sharing, especially when information related to real-time situations must be obtained.[65] These concerns may have a greater impact on the limitation of sharing information than they would in the case of environmental law, regardless of the importance of information sharing. Moreover, it would be difficult to collect personal information (which is often held by the private sector) and share it with other States, even in cases of serious transboundary harm, because of privacy concerns.

Although there are potentially huge limitations, an open and uninterrupted channel of information sharing and communication with other States and possibly with non-State actors remains important.[66] Considering the essential role of non-State actors, it would be effective and in the interests of both States and the private sector to create stronger safeguards against cyber incidents.[67] Non-State actors also have contractual obligations to their clients, a duty of care through which they provide a secure network for their data, and a fiduciary duty to keep their data secure.[68]

Therefore, creating "networks" within and beyond States seems useful and potentially essential to ensuring that national security is not jeopardized, in addition to maintaining independence from each other. Timely information sharing is becoming increasingly essential in fighting

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[65] Gross, *Cyber Responsibility to Protect: Legal Obligations of States Directly Affected by Cyber-Incidents*, at 507–508 (cited in note 34).

[66] Id at 496.

[67] Id at 496.

[68] Id at 497.

cyberattacks. Exchanging information on actual criminal activity may be possible only when both States agree to cooperate, and such cooperation should be strongly encouraged.

4. Non-State Actors

4.1 Private Sector

The private sector plays a key role in cyberspace, that is, it has de facto control over most Internet infrastructure, and more than 90 percent of the critical US national Internet infrastructure is in the private sector.[69] However, States are generally not responsible for the conduct of non-State actors that cause harm to other States due to a territorial link alone.[70] According to the Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons[71] and in the Gabcikovo–Nagymaros Project,[72] the decision requests several conditions in addition to territorial link for State's responsibility: States are required to act to prevent significant transboundary harm when such harm is caused by a disposition over their territory, when such States have an opportunity to do so, and when it is foreseeable that the disposition would cause significant transboundary harm and the measures required to prevent such harm are proportionate.[73]

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[69] Shackelford, *Managing Cyber Attacks in International Law, Business, and Relations: In Search of Cyber Peace*. 79 (cited in note 55).

[70] Buchan, *Cyberspace, non-state actors and the obligation to prevent transboundary harm,* at 430 (cited in note 48).

[71] *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, [1996] I.C.J. Rep. 1996 (I) at 257 ¶ 78.

[72] Case concerning Gabcikovo-Nagymaros Project *(Hungary/Slovakia)*, I.C.J. Rep. 1997 at 41, ¶ 53.

[73] Nikolas Bremer, *Post-environmental impact assessment monitoring of measures or activities with significant transboundary impact: An assessment of customary international law*. 26 RECIEL 80, 87 (2017).

4.2 Role of State in Regulating the Private Sector

Individuals acting within a State's jurisdiction are required to respect due diligence obligations. For circumstances in which activities are conducted by a private person or enterprise, the obligation of the State is to establish the appropriate regulatory framework and apply it, as States can request that private sector actors follow domestic laws.[74] This may be an "absolute obligation" to prevent their territories from being used or their legal rights violated under customary law.[75] This obligation is critical to preventing and punishing cybercrime, but its effectiveness may be limited since States have discretion regarding which regulations they create and the ways in which they choose to control cyberspace. As mentioned above, it is difficult to determine the party responsible for cyberattacks, and specific efforts by States are required to prevent serious damage from originating within their State territory. According to GGE, "States should not knowingly allow their territory to be used for internationally wrongful acts using ICTs."[76]

Therefore, as a due diligence obligation, States may be requested to pass national laws that reflect international consensus and are supported by solid technical knowledge.[77] The State obligation to individuals may align with that illustrated by the cases of the *SS Lotus*,[78] indicating the State's obligation to prevent the commissioning of criminal acts against another nation or its people on its territory, and the *Wipperman* case,[79] which stated that the State is not responsible for acts of private individuals on its territory, provided the State uses "reasonable

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[74] ILA Study Group on International Law and Cyberterrorism, Study Group Report, at 62 (2016), available at http://cyberregstrategies.com/wp-content/uploads/2017/03/ILA_SG_Cyber_Terrorism_FINAL_REPORT.pdf

[75] Buchan, *Cyberspace, non-state actors and the obligation to prevent transboundary harm*, at 431 (cited in note 48).

[76] UN, General Assembly, A/70/174, Group of Governmental Experts on Developments in the Field of Information and Telecommunications in the Context of International Security, at 8 ¶ 13(c) (cited in note 11)

[77] Joanna Kulesza, *Due Diligence in International Law* 300–301(Brill Nijhoff, 2016).

[78] Case of the SS Lotus (*France v. Turkey*) 1927 PCIJ Series A, No. 10. Justice Moore at 88, referencing the US Supreme Court case of *United States v. Arjona*, 120 US 479 (1887).

[79] *Wipperman Case* (*United States of America v. Venezuela*) (1887), reprinted in J. Bassett Moore, *History and Digest of the International Arbitrations to Which the United States Has Been a Party*, 3, 3041, (1898–1906)

diligence" to prevent the occurrence of wrongdoing.[80] This is similar to the due diligence obligations in international law: States are required to exercise their due diligence obligation to prevent significant transboundary harm.

As a result, a State can incur responsibility when it fails to satisfy its primary obligations, whether conventional or customary, to take positive action in relation to the conduct of a non-State actor operating on its territory or, more broadly, any actor that is subject to its jurisdiction or legislative framework. Indeed, experts agree that States have a due diligence obligation in terms of the government and private cyberinfrastructure and cyber activities on their territory. If a State fails to meet its due diligence obligations, a victim State can claim the right to legal remedies when appropriate.[81]

In other words, although the due diligence obligation under customary international law may not be directly applicable to the private sector, States have an obligation to ensure that non-State actors under their jurisdiction obey international law. Indeed, States are required to take measures to terminate wrongful acts and mitigate transboundary harm. Therefore, it can be concluded that the private sector has an "indirect" obligation to respect its due diligence obligations under customary law in terms of cybersecurity if States impose obligations on the private sector in their domestic law to an equal or higher degree of obligation.

5. Cybersecurity Applicability

Establishing a solid understanding of due diligence is crucial to preventing significant transboundary harm; it clarifies the standard of States' obligations to protect persons or activities

[80] Jonathan Bonnitcha and Robert McCorquodale, *The Concept of "Due Diligence" in the UN Guiding Principles on Business and Human Rights,* 28 Eur J Int L, 899, 901(2017).

[81] Michael Schmitt, N. 2015. *In defense of due diligence in cyberspace*. 125 The Yale Law Journal Forum 68, 70 (2015).

within or beyond their respective territories to prevent harmful events and outcomes. This chapter clarified the procedural duties—that is, cooperation, notification, consultation, and environmental impact assessment—in the context of international watercourses.

As this chapter showed, procedural rules have been developed and consolidated to underline due diligence obligations. Recent cases have clarified that substantial duties pertaining to the prevention of transboundary harm must be implemented in consideration of other duties of a procedural nature such as the duties to cooperate, notify, consult, seek prior informed consent of relevant parties, and conduct EIAs.

The field of international cybersecurity law remains relatively immature, and cyberspace poses difficulties for establishing international agreement owing to rapid technical development and national security concerns. Attribution, the nexus of the individual and the State, is more demanding in cyberspace because of anonymity, multistage actions, and operation speed, and the modality of State responsibility under due diligence obligations can respond to such challenging questions. As Rule 6 of the Tallinn Manual indicates, the due diligence principle can apply to cyberoperations, but it does not describe the kinds of actions that drive the due diligence principle.

Because of the unique features of cyberspace, including the difficulty of attribution and its technical nature, speed, and interconnectivity, higher risks may exist in this realm and impose additional or modified procedural duties on the State, such as the monitoring of activities, early notification, impact assessment, and cooperation. It would also be effective and in the interest of both State and non-State actors to create stronger safeguards against cyber incidents. Therefore, information sharing between parties is required. Although the creation of an internationally binding agreement or cybercrime convention may be very difficult because of ongoing developments in both technology and national security, it would be required to

establish an international cyberattack monitoring and warning system, as cyberattacks are intentional human acts.

While due diligence obligations may not be directly applicable to non-State actors, States have an obligation to ensure that non-State actors under their jurisdiction obey international law. Developing appropriate legislation, strategies, and regulatory frameworks may constitute a substitute for due diligence obligations under customary law for non-State actors. Given the huge gap in technical and economic development among States, international cooperation in the creation of international monitoring and early warning systems, for example, is essential for taking measures that are beyond some countries' means or are otherwise unreasonable.

Chapter 5 Conclusion

1. Due Diligence Obligations

Recent decisions related to the spread of land-based pollution to the sea and international watercourses provide an opportunity to develop the definition and role of due diligence obligations. Due diligence obligations can become a crucial tool for States to prevent transboundary harm. Although it has long been in place, due diligence is also an evolving principle of international law that can be applied to laws governing cyberspace. Indeed, due diligence is central to cybersecurity because no uniform concept exists of the standards of conduct by which States are expected to prevent harm to other States.

Preventing transboundary harm is a fundamental principle of international environmental law, and such obligations are generally interpreted as due diligence obligations. This principle of no harm is breached only when the State of origin has not acted diligently regarding its own activities over State-owned enterprises or private activities. States are not required to achieve specific results as long as they make the best possible effort to obtain results.

This study first clarified the concept of due diligence and then explored its applicability to the areas of land-based pollution to the sea, international watercourses, and cyberoperations referring to international discussions and cases. Because of cross-border interconnectivity, there are certain features in the areas of environmental law and cybersecurity law in terms of sovereignty, State responsibility, and their existence as a common concern of humans. States can use the principle of due diligence, taking into consideration the specific nature of the respective areas, to demonstrate that they are taking reasonable and appropriate steps to prevent significant transboundary harm to other States, specifically by following procedural duties.

2. Land-Based Pollution to the Sea

Chapter 3 examined State obligations concerning land-based pollution to the sea. The assumption was that land-based pollution may result in significant transboundary marine pollution, as seen in the series of instances in which radioactive contaminated water was released from the Fukushima Daiichi nuclear power plant in 2011. Prior studies concluded that it is difficult to apply UNCLOS articles on land-based pollution to the sea in the case of the Fukushima Daiichi nuclear power plant accident in Japan owing to the significant discretionary power given to States under Articles 192, 194, and 207 of UNCLOS, the flexible nature of the treaty language of UNCLOS, the limitations of national sovereignty, and a lack of awareness of the potentially transboundary nature of land-based pollution. However, States have due diligence obligations to prevent the spread of land-based pollution to the seas that could lead to significant transboundary environmental harm under Part XII of UNCLOS and customary law. As previously discussed, UNCLOS includes provisions imposing general and specific obligations to prevent marine pollution, rather than detailed provisions for each case to which it may apply.

Having examined the relationship between UNCLOS and the due diligence obligations, which were developed in the Advisory Opinion of the Seabed Disputes Chamber of the ITLOS, and the award rendered in the *Philippines v. China*, it is concluded that States have a due obligation to prevent land-based pollution to the sea that could bring about serious transboundary environmental harm under Part XII of the UNCLOS and customary law. Indeed, due diligence obligations could fill part of the gap left by the lack of implementation of Articles 207, 213, 194, and 192 of UNCLOS.

Regardless of the complexity of land-based pollution in the sea and considering economic, political, and social elements from one country to another, it was examined several declarations, global action plans, and programs pertaining to land-based pollution to the sea at the UN and

regional levels. Regional conventions and accompanying technical programs should be accelerated, specifically for regions that lack the conventions, protocols, and programs to control land-based pollution to the sea, owing to an increase in pollution near the coasts in this area; such close control in specific regions may be more relevant and effective.

3. Procedural Duties

In Chapter 4, the thesis analyzed the procedural duties of due diligence obligations regarding transboundary harm in international watercourses considering recent ICJ cases. It was also proposed that due diligence obligations may be an important tool for responding to complex issues such as cybersecurity, considering their global impact and the limitations of uniform legal frameworks. It was also explored the responsibility of non-State actors in the context of cybersecurity.

Establishing a solid understanding of due diligence clarifies the standard of States' obligations to protect persons or activities within or beyond their respective territories to prevent harmful outcomes. As indicated by recent ICJ cases, procedural rules have been developed that underline due diligence obligations. Substantial duties related to the prevention of transboundary harm must be implemented in consideration of procedural duties: that is, cooperation, notification, consultation, prior informed consent, and EIA.

The scope of regulation of cyberspace at an international level is limited because of different technical development stages, as well as national security concerns. However, there may be a higher risk in the area of cyberspace than of the environment because of the former's interconnectivity and technical features. States have a due diligence obligation to refrain from knowingly allowing their territories to be used for internationally wrongful acts using ICT and to prevent cyberattacks. In terms of procedural duties, States should engage in monitoring, send

early notifications, and conduct impact assessments. Information sharing with the private sector would create stronger safeguards against cyber incidents, considering its important role.

States also have an obligation to ensure that non-State actors under their jurisdiction obey international law. At present, States are endeavoring to take stricter measures to prevent cyber incidents by developing appropriate legislation; this may constitute a substitute for due diligence obligations under customary law. Since there are significant gaps in technical and economic development among States, international cooperation is essential in this regard to take measures that are beyond some countries' means or are otherwise unreasonable. As proposed, establishing an international monitoring system or technical assistance would assist States that do not have advanced cyber technologies to comply with the procedural duties as part of due diligence obligations. This can also be used for States that have advanced technologies because such a system of assistance would contribute to the avoidance of cyber-indecent risk globally, as harm in cyberspace does not recognize borders.