



UiT The Arctic University of Norway

Faculty of Law

**[A Law of the Sea perspective on the discharge of nuclear wastewater-
using Fukushima as an example]**

[Yingqiu Wang]

Master's thesis in [Law of the Sea]...[JUR-3910-1-23V]...[September 2023]

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List of abbreviations

TEPCO	Tokyo Electric Power Company
ALPS	Advanced Liquid Processing System
UNCLOS	United Nations Convention on the Law of the Sea
London Convention	Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972
1996 Protocol	1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972
ICJ	International Court of Justice
VCLT	Vienna Convention on the Law of Treaties
Stockholm Declaration	1972 Stockholm Declaration on the Human Environment
Rio Declaration	1992 Rio Declaration on Environment and Development
IAEA	International Atomic Energy Agency
ITLOS	International Tribunal for the Law of the Sea
EIA	Environmental Impact Assessment
CAOF Agreement	2018 Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean
Montreal Guidelines	Montreal Guidelines for the Protection of the Marine Environment against Pollution from Land-Based Sources
GPA	Global Programme of Action for the Protection of the Marine Environment from Land-based Activities
UNEP	United Nations Environment Programme

Helsinki Convention	Convention on the Pollution of the Marine Environment of the Baltic
IMO	International Maritime Organization
COBSEA	Coordinating Body on the Seas of East Asia
NOWPAP	Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region
GWWI	The Global Wastewater Initiative

1 Introduction

1.1 Background

The magnitude 9.0 earthquake on 11th March, 2011, caused a severe leakage of radionuclides from the Fukushima Daiichi Nuclear Power Plant. ¹ To cool the molten nuclear fuel, the Tokyo Electric Power Company (TEPCO) continues to inject large amounts of seawater into the nuclear facility, resulting in approximately 100 tons of nuclear wastewater per day. ² TEPCO puts the contaminated water into storage tanks after treatment, but the tanks will be full by 2023, so the Japanese government announced in April 2021 that the nuclear wastewater would be discharged into the ocean two years from then. ³

This decision has raised a lot of controversy, including the question whether nuclear wastewater can legally be discharged into the oceans. The issue has been discussed in the paper “Contemporary International Law:Regulating the Upcoming Fukushima Radioactive Wastewater Discharge”, which focuses on three aspects of the analysis: the definition of dumping, the composition of the waste, and the space for disposal. This thesis will also discuss these three points, but will go further by analyzing them not only in the context of the actual situation of the construction of the pipeline in Japan, but also in relation to the treaty as a whole, exploring additional possibilities for the legal nature of nuclear wastewater discharges. And, Jesus analyzed Japan’s obligations under UNCLOS in her paper “Preserving the Sea in a Radioactive World: How Japan’s Plan to Release Treated Nuclear Wastewater into the Pacific Ocean Violates UNCLOS”, where she argues that Japan is only in breach of Article 192 and Article 207, and that the present thesis will discuss additional obligations beyond these two, such as the obligation of cooperation and notification.

This forms the background of this thesis’ investigation into how the international law of the sea regulates the discharge of nuclear wastewater, as described next.

¹ Yan Chen, “Japan's Millions of Tons of Fukushima Nuclear Wastewater Discharge Imminent - Would you drink a can of peach juice from there?,” BBC News Chinese, March 29, 2023, <https://www.bbc.com/zhongwen/simp/world-65107965>.

² Ibid.

³ Ibid.

1.2 Objective and scope of the thesis

The objective of this thesis is to analyse relevant legal regimes regarding the discharge of nuclear wastewater into the sea and discuss the key gaps remain of the existing system to protect the marine environment from this kind of practice.

Nuclear wastewater can harm not only the marine environment but also human health, for example, radioactive substances can accumulate in fish and other marine species, and humans can absorb these substances through the consumption of seafood. However, this thesis focuses only on the protection of the marine environment, not on any impacts on human health and life and whether this raises questions about the protection of human rights. Moreover, unlike general wastewater, nuclear wastewater contains a variety of radioactive substances, which may bring into play obligations under the Convention on Early Notification and the Convention on Nuclear Safety. This thesis analyzes them only under the law of the sea and not under international nuclear law. Nor will this thesis discuss whether the decision to discharge is in line with Japanese domestic law.

With these limitations in mind, the main research question that this thesis asks is “Does the law of the sea adequately regulate the discharge of nuclear wastewater into the oceans so as to protect the marine environment?”. This can be broken down as follows. First, what is the ‘legal nature’ of nuclear wastewater discharge under the law of the sea regime? Second, what are the rights and obligations of the discharging State and neighbouring States facing the discharge of nuclear wastewater? Third, what gaps remain in the existing law from the point of view of protecting the marine environment, and how could these gaps be filled?

1.3 Sources and methodology

To undertake these steps and to answer the research questions, this thesis takes a doctrinal approach. Doctrinal research aims to give a systematic exposition of the principles, rules, and concepts governing a particular legal field or institution and analyses the relationship between these principles, rules, and concepts to solve unclarities and gaps in the existing law.⁴

In the light of Article 38 of the Statute of the International Court of Justice, treaties, custom and general principles have historically been the main sources of binding international law, with judicial decisions and the teachings of the most highly qualified publicists as secondary

⁴ Jan M. Smits, “What Is Legal Doctrine? On the Aims and Methods of Legal-Dogmatic Research,” SSRN Electronic Journal, 2015, <https://doi.org/10.2139/ssrn.2644088>, 5.

sources.⁵ As the most important and fundamental framework treaty of the international law of the sea, this thesis will discuss the research questions from the perspective of UNCLOS. However, as a framework treaty, UNCLOS does not provide much detail and clarity on many issues, so other “generally accepted international rules and standards” are needed to answer the questions.⁶ For example, in relation to the protection of the marine environment from pollution by dumping, Article 210 of UNCLOS only stipulates “National laws, regulations and measures shall be no less effective in preventing, reducing and controlling such pollution than global rules and standards”, with no reference to what ‘global rules and standards’ are. However, it states that “Affirming that matters not regulated by this Convention continue to be governed by the rules and principles of general international law” in Preamble. Thus, according to Proelss’s analysis of this provision,⁷ the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (1972 London Convention) and 1996 Protocol will be used to address the relevant issues. When it comes to interpreting these conventions, Article 31 of the Vienna Convention on the Law of Treaties (VCLT) will be followed. According to Birnie, the VCLT encapsulates the “three major schools of thought on treaty interpretation - the literal, the ‘effective’, and the teleological approaches”.⁸ Thus, the ordinary meaning of the words to be interpreted must be sought first and foremost, but the interpretation must be made in the light of the general context of the convention being interpreted.⁹ And, the interpretation must be given in good faith and in accordance with the objectives and process of the convention, which means that it must, as far as possible, be the interpretation that gives effect to the convention.¹⁰ Lastly, in the event of ambiguity, a series of preparatory documents in the treaty-drafting process could be used to verify and thus derive an interpretation.¹¹ With regard to the protection of the marine environment, this thesis will also refer to the general principles of international environmental law and the classic cases and court decisions relating to them in order to help better understand these principles.

⁵ Patricia Birnie, Alan E. Boyle, and Catherine Redgwell, *International Law and the Environment* (Oxford, UK: Oxford University Press, 2009), 15.

⁶ *Ibid.*, 17.

⁷ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1418.

⁸ Patricia Birnie, Alan E. Boyle, and Catherine Redgwell, *International Law and the Environment* (Oxford, UK: Oxford University Press, 2009), 19.

⁹ *Ibid.*

¹⁰ *Ibid.*

¹¹ *Ibid.*

In particular, the 1972 Stockholm Declaration on the Human Environment (Stockholm Declaration) and the 1992 Rio Declaration on Environment and Development (Rio Declaration) are mentioned in Chapter 4 in the context of the fundamental principles of international environmental law. These two important declarations as soft law instruments interact with treaties and custom to form a regulatory system for the protection of the marine environment.¹² Alan believes that “Both treaties and soft law instruments can be vehicles for focusing consensus on rules and principles, and for mobilizing a consistent, general response on the part of states.”¹³ In addition to treaties, international general principles and case law judgments, legal commentary (‘the teachings of the most highly qualified publicists’) will also be referred to for its views on the state of the law, and for relevant interpretations and critiques.

1.4 Structure of the thesis

This thesis has six chapters, Chapter 1 is an introduction, including background, objective and scope of the thesis, sources and methodology, and the structure of the thesis. Chapter 2 introduces the circumstances surrounding the Fukushima Daiichi Nuclear Power Plant and impacts of nuclear wastewater. Chapter 3 will analyze the legal nature of nuclear wastewater discharge. And then, the obligations of nuclear wastewater discharging States and rights of their neighboring States will be discussed in Chapter 4. The existing system for regulating nuclear wastewater discharge will be examined in chapter 5, and finally the conclusion in chapter 6.

2 The discharge of nuclear wastewater: practice and environmental issues

2.1 Current practice on nuclear wastewater discharge

Since mankind developed the use of nuclear energy, there have been a number of nuclear accidents around the world. Only the Chernobyl nuclear accident and Fukushima Daiichi nuclear accident are rated as the highest level seven events on the International Nuclear Event

¹² Lavanya Rajamani and Jacqueline Peel, *The Oxford Handbook of International Environmental Law* (Oxford, UK: Oxford University Press, 2021), 420.

¹³ *Ibid*, 423.

Scale,¹⁴ but Japan was the first country to decide to discharge nuclear wastewater into the ocean.

In the nuclear accident triggered by the explosion of the reactor at the Chernobyl nuclear power plant in 1986, the failure to design an airtight containment vessel led to the release of large quantities of radioactive substances into the environment, affecting the environment of an area of millions of square kilometers and the safety of the public.¹⁵ The Government of the time opted for the construction of a sarcophagus to contain the ruins of the wrecked reactor in order to control the proliferation of radioactive substances, and through the reinforcement of the sarcophagus with long-term maintenance and the construction of a new sarcophagus, it was able to tightly control the expansion of the scope of impact of the nuclear accident and to reduce to a minimum the contamination generated by the nuclear accident.¹⁶

On 11 March 2011, two tsunami waves hit the Fukushima Daiichi Nuclear Power Plant following a 9.1 magnitude earthquake off the east coast of the Japanese main island.¹⁷ The reactor cooling system of Units 1 and 3 at the Fukushima Daiichi Nuclear Power Plant was damaged and the nuclear fuel melted down.¹⁸ In order to control the reactor temperature, the Tokyo Electric Power Company (TEPCO), which is responsible for managing the plant, injected large amounts of cooling water, resulting in the production of nuclear effluent containing radioactive substances.¹⁹ TEPCO puts the contaminated water into storage tanks after treatment, but the tanks will be full by 2023, so the Japanese government announced in

¹⁴ "Fukushima Daiichi Nuclear Accident," IAEA, November 1, 2021, <https://www.iaea.org/topics/response/fukushima-daiichi-nuclear-accident>.

¹⁵ Canling Liu and Xiang Wang, "Study on International Environmental Law on Accidental Nuclear Wastewater Disposal - A Perspective on the Fukushima Nuclear Wastewater Incident in Japan" , *Academic Forum of Nandu(Journal of the Humanities and Social Sciences)*,2021. 10.16700/j.cnki.cn41-1157/c.2021.05.008.

¹⁶ Ibid.

¹⁷ Lesley M.M. Blume, "Japan Plans to Release Fukushima Water into the Pacific-Is It Dangerous?," *Premium*, May 25, 2023, <https://www.nationalgeographic.com/premium/article/fukushima-japan-nuclear-wastewater-pacific-ocean>.

¹⁸ "Concerns over plans to send wastewater from Japan's Fukushima nuclear plant to the sea," *BBC News Chinese*, October 26, 2020, <https://www.bbc.com/zhongwen/simp/world-54675012>.

¹⁹ Ibid.

April 2021 that the nuclear wastewater would be discharged into the ocean two years from then.²⁰ This process will last for 30 years.²¹

After the announcement of the Japanese government's decision to discharge nuclear wastewater into the sea on 13 April 2021, TEPCO officially began work in August last year on a plan to build an undersea tunnel inside the Fukushima Daiichi Nuclear Power Plant to discharge nuclear-contaminated water into the sea, and completed excavation work in late April this year.²² TEPCO plans to discharge treated contaminated water from the plant into the sea through this 1 km-long pipeline.²³ TEPCO said on June 6th that the operation of filling seawater into the cross-harbour tunnel had ended that morning and all the related works were expected to be completed by the end of June.²⁴ According to Japanese media reports, TEPCO started filling the undersea tunnel with seawater from the afternoon of June 5th and completed the filling operation of about 6,000 tons of seawater at around 5am local time on June 6th.²⁵ According to the report, the discharge mechanism of the undersea tunnel is to convey the diluted nuclear-contaminated water discharged on land to the outfall at sea through the tunnel filled with seawater.²⁶

2.2 The scale and impacts of nuclear wastewater discharge

The nuclear waste water from the Fukushima Daiichi Nuclear Power Plant contains a variety of radioactive substances, including cesium, strontium and tritium.²⁷ Professor Lin from China holds the view that the nuclear wastewater from Fukushima is different from the wastewater produced in the production process of nuclear power plants, wastewater generated in the production process of nuclear power plants is discharged after strict safety treatment and belongs to industrial wastewater in a broad sense, but the nuclear wastewater of

²⁰ Ibid.

²¹ Kelly Ng, "Fukushima Nuclear Disaster: Japan to Release Treated Water in 48 Hours," BBC News, August 22, 2023, <https://www.bbc.com/news/world-asia-66578158>.

²² Hongliang Liu, "TEPCO announces completion of seawater filling operations in the undersea tunnel that discharges nuclear-contaminated water; Japanese people strongly oppose the government's plan to drain the sea," Tencent News, June 9, 2023, <https://new.qq.com/rain/a/20230609A0B9NZ00>.

²³ Ibid.

²⁴ Ibid.

²⁵ Ibid.

²⁶ Ibid.

²⁷ Yang Liu, "Science: Three questions about Fukushima nuclear wastewater," Xinhua News, April 13, 2021, http://www.xinhuanet.com/world/2021-04/13/c_1127325596.htm.

Fukushima contains a large amount of ecologically hazardous nuclear elements, and even if the content of hazardous elements is reduced through artificial treatment, it is still not confirmed to be consistent with the wastewater from daily production processes.²⁸

The Japanese government and TEPCO claim that using a filtration device called a “Advanced Liquid Processing System” can filter out 62 radioactive substances other than tritium, which is difficult to remove from the water.²⁹ Ken Buesseler, a marine radiochemist and adviser to the Pacific Islands Forum, says that the filtration system has not yet been shown to be effective all of the time, and there are other highly concerning elements that they haven’t been able to clean up, “such as cesium and strontium-90, an isotope that increases risks of bone cancer and leukemia, earning it the sinister designation of ‘bone seeker’.”³⁰ His concern can be proved by the report from South Korean and the report from Greenpeace. The first director of the South Korean State Adjustment Office said that the South Korean government’s Fukushima nuclear wastewater treatment facility inspection team, during its on-site visit to Japan in May, was informed that the Advanced Liquid Processing System (ALPS) at the Fukushima nuclear power plant had experienced eight failures between 2013 and 2022, including equipment corrosion and equipment filter failures, among other things.³¹ Also, according to the report from Greenpeace, as a result of the failure of the ALPS, 72% of the water in the storage tanks now needs to be retreated, but serious questions remain as to how effective this will be.³² TEPCO first acknowledged the presence of significant amounts of carbon-14 in the contaminated tank water on August 27, 2020, because the ALPS was not

²⁸ Canling Liu and Xiang Wang, “Study on International Environmental Law on Accidental Nuclear Wastewater Disposal - A Perspective on the Fukushima Nuclear Wastewater Incident in Japan”, *Academic Forum of Nandu(Journal of the Humanities and Social Sciences)*,2021.

²⁹ Yang Liu, “Science: Three questions about Fukushima nuclear wastewater,” Xinhua News, April 13, 2021, http://www.xinhuanet.com/world/2021-04/13/c_1127325596.htm.

³⁰ Lesley M.M. Blume, “Japan Plans to Release Fukushima Water into the Pacific-Is It Dangerous?,” *Premium*, May 25, 2023, <https://www.nationalgeographic.com/premium/article/fukushima-japan-nuclear-wastewater-pacific-ocean>.

³¹ Jingtong Qian, “Fukushima Nuclear Sewage 20,000 Times over the Limit? South Korean Government Released a Survey ‘ Beat’ the Japanese Side,” *News(cctv.com)*, June 17, 2023, <https://news.cctv.com/2023/06/17/ARTItc3grnQfpeLRqcteRS6a230617.shtml>.

³² Shaun Burnie, “The Reality of the Fukushima Radioactive Water Crisis - Greenpeace,” *The reality of the Fukushima Radioactive Water Crisis*, October 2020, https://www.greenpeace.org/static/planet4-japan-Stateless/2020/10/5768c541-the-reality-of-the-fukushima-radioactive-water-crisis_en_summary.pdf.

designed to remove it.³³ Carbon-14 is incorporated into all living matter to varying factors of concentration.³⁴ Shaun believes that “If the contaminated water is discharged to the Pacific Ocean, all of the carbon-14 will be released to the environment, and with a half-life of 5,730 years, carbon-14 is a major contributor to global human collective dose; once introduced into the environment it will be delivered to local, regional and global populations for many generations.”³⁵

A recent report released by TEPCO shows that the radioactive elements in the sea fish caught in the harbour of Fukushima Daiichi Nuclear Power Plant in May this year exceeded the standard, with the radioactive element cesium reaching 18,000 becquerels per kilogram, which is 180 times more than the standard set by the Japanese Food Sanitation Law.³⁶ This is ample proof that the future damage to the marine environment caused by Japan’s nuclear-contaminated water discharge could be extremely long-term and heavy.³⁷ These radioactive substances can be absorbed and enriched by organisms in the ocean, thus entering the food chain and gradually accumulating, posing a potential risk to various organisms and plants in the marine ecological chain.³⁸

According to Robert Richmond, director of the Kewalo Marine Laboratory at the University of Hawaii, and a scientific adviser on the discharge plan to the Pacific Islands Forum, “It’s a trans-boundary and trans-generational event”, because “anything released into the ocean off of Fukushima is not going to stay in one place.”³⁹ Richmond basing its judgement on previous studies that “radionuclides and debris released during the initial Fukushima accident were quickly detected nearly 5,500 miles away off the coast of California”, believes that “radioactive elements in the planned wastewater discharges may once again spread across the

³³ Ibid.

³⁴ Ibid.

³⁵ Ibid.

³⁶ Hongliang Liu, “TEPCO announces completion of seawater filling operations in the undersea tunnel that discharges nuclear-contaminated water; Japanese people strongly oppose the government’s plan to drain the sea,” Tencent News, June 9, 2023, <https://new.qq.com/rain/a/20230609A0B9NZ00>.

³⁷ Ibid.

³⁸ Ibid.

³⁹ Lesley M.M. Blume, “Japan Plans to Release Fukushima Water into the Pacific-Is It Dangerous?,” Premium, May 25, 2023, <https://www.nationalgeographic.com/premium/article/fukushima-japan-nuclear-wastewater-pacific-ocean>.

ocean”.⁴⁰ Radionuclides can be spread around the world not only by ocean currents but also by marine organisms, “one 2012 study cite ‘unequivocal evidence’ that Pacific bluefin tuna carrying Fukushima-derived radionuclides reached the San Diego coast within six months of the 2011 accident.”⁴¹ Furthermore, phytoplankton, as the basis of the food chain of all marine organisms, can take in radionuclides from Fukushima nuclear wastewater, and these radionuclides will therefore “accumulate in a variety of invertebrates, fish, marine mammals, and humans”.⁴² Besides, a study earlier this year referred to the increasingly widespread presence of tiny plastic particles, or microplastics, in the oceans as a possible "Trojan horse" for radionuclide migration.⁴³ In addition to the deep concerns of Richmond and his colleagues about Japan’s plan for nuclear wastewater discharge, the United States-based National Association of Marine Laboratories released a statement in December 2022 opposing the nuclear wastewater discharge plan, which said “a lack of adequate and accurate scientific data supporting Japan’s assertion of safety,” and potentially threaten the “largest continuous body of water on the planet, containing the greatest biomass of organisms ... including 70 percent of the world’s fisheries.”⁴⁴

In summary, the key risks can be summed up as these three aspects. Firstly, ALPS is not as safe and efficient as Japan claims, and there are many pitfalls, so it is doubtful whether the system can always operate effectively. Secondly, ALPS does not effectively filter out radioactive substances other than tritium, such as carbon 14, cesium and strontium-90, and these radioactive substances can cause varying degrees of damage to humans and marine life. Thirdly, the continuous discharge for 30 years will cause harmful substances to accumulate in marine organisms and spread around the world along with ocean currents.

3 Classifying the discharge of nuclear wastewater under the UNCLOS

A preliminary question that arises is whether the discharge of nuclear wastewater is, legally, a form of pollution under the UNCLOS. According to Article 1(1)(4), the definition of “pollution of the marine environment” is “the introduction by man, directly and indirectly, of

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Ibid.

⁴³ Ibid.

⁴⁴ Ibid.

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”. According to professor Tanaka, this provision calls for three brief comments:

“First, this is an open definition which may include all sources - the existing and new sources - of marine pollution. Second, the definition covers substances or energy which ‘is likely to result’ in deleterious effects. It would follow that potentially harmful effects on the marine environment can also become the object of regulation. Third, as shown in the reference to ‘living resources and marine life’, this definition makes clear that ‘the marine environment encompasses marine living organisms’.”⁴⁵

The discharge of nuclear wastewater is a direct human introduction of substances into the sea, which contains radioactive elements that will damage marine life and endanger human health, and impeding marine activities such as fishing by damaging the marine living resources. Therefore, nuclear wastewater discharge falls within the definition of “pollution of the marine environment”.

Coming to Part XII of UNCLOS, section 5 further divides pollution into six categories based on source, which are pollution from land-based sources, pollution from seabed activities subject to national jurisdiction, pollution from activities in the Area, pollution by dumping, pollution from vessels and pollution from or through the atmosphere. As Japan will use a tunnel of approximately 2.5 meters in diameter and 1 kilometre in length, located 12 meters below sea level to discharge nuclear wastewater,⁴⁶ which is clearly not pollution from vessels, pollution from activities in the Area, or pollution from or through the atmosphere. Therefore, the next paragraphs will consider in turn whether this may be considered pollution from land-based sources, seabed activities subject to national jurisdiction, or dumping.

The definition of pollution from land-based sources can be found in Article 207(1), whereby “States shall adopt laws and regulations to prevent, reduce and control pollution of marine

⁴⁵ Yoshifumi Tanaka, *The International Law of the Sea* (Cambridge, United Kingdom: Cambridge University Press, 2023), 354.

⁴⁶ “Undersea Tunnel to Discharge Fukushima Daiichi Water,” Undersea tunnel to discharge Fukushima Daiichi water : Regulation & Safety - World Nuclear News, August 26, 2021, <https://www.world-nuclear-news.org/Articles/Undersea-tunnel-to-discharge-Fukushima-Daiichi-wat>.

environment from land-based sources, including rivers, estuaries, pipelines and outfall structures....” James argues that “This is an illustrative list, and the obligation covers all potential land-based sources of marine pollution”.⁴⁷ Since Japan will discharge nuclear wastewater into the sea through 1km long pipeline, and the nuclear wastewater is from the nuclear power plant which located in the land, it likely falls within the definition of land-based pollution.

There is no obvious and clear definition of “ pollution from seabed activities subject to national jurisdiction” in UNCLOS, only Article 194(3)(c) refers to the obligation to “prevent, reduce and control pollution from installations and devices used in exploration or exploitation of the natural resources of the seabed and subsoil”, and Article 208(1) refers to “coastal States should adopt laws and regulations to prevent, reduce and control pollution of the marine environment arising from or in connection with seabed activities subject to their jurisdiction and from artificial islands, installations and structures under their jurisdiction, pursuant to article 60 and 80”. Harrison believes that the convention can be interpreted in an incremental way to cover new uses emerging from the seabed, it certainly includes oil and gas drilling, seabed mining and the construction and operation of renewable energy devices or structures.⁴⁸ Further, “Article 208 was amended in the drafting process to apply not only to seabed activities themselves but also to pollution arising ‘in connection with seabed activities’.”⁴⁹ Thus, this wording can be understood as extending “the rights and duties of the coastal State to cover associated activities, such as the storage of resources pending processing or shipment.”⁵⁰ Although constructed on the seabed within the area under Japan’s jurisdiction, the undersea tunnel built by TEPCO was not intended for the exploitation or exploration of natural resources, nor was it intended for activities related to seabed activities. As the undersea tunnel is only used for discharging nuclear wastewater, it cannot be classified as “ pollution from seabed activities subject to national jurisdiction”.

Finally, the question arises whether the nuclear wastewater discharge is dumping or not. The definition of “dumping” can be found in Article 1(1)(5) of UNCLOS, Article III(1) of the 1972 London Convention and Article 1(4) of the 1996 Protocol. The definition under Article

⁴⁷ James Harrison, *Saving the Oceans through Law: The International Legal Framework for the Protection of the Marine Environment* (Oxford, UK: Oxford University press, 2017), 66.

⁴⁸ *Ibid*, 212.

⁴⁹ *Ibid*.

⁵⁰ *Ibid*.

1(1)(5) is a replica of the definition provided in Article III(1) of the 1972 London Convention⁵¹. The 1996 Protocol, which superseded the London Dumping Convention and was amended in 2006, contains a more detailed definition of dumping.⁵² With regard to Article 23 of the 1996 Protocol, “this Protocol will supersede the Convention as between Contracting Parties to this Protocol which are also Parties to the Convention”. Since Japan is a Party to both the 1972 London Convention and the 1996 Protocol, the discussion on whether the discharge of nuclear wastewater from Fukushima nuclear power plant is considered dumping can be initiated using the 1996 Protocol as a standard. However, not all States are Parties to both the 1972 London Convention and the 1996 Protocol. According to IMO, there are 87 member States to the London Convention, while there are only 53 Parties to the 1996 Protocol,⁵³ so this thesis will consider both. First, it will discuss the situation of Japan, which is a Party to both the 1972 London Convention and the 1996 Protocol. Second, it will turn to the situation of States that are only Parties to the 1972 London Convention, but not the 1996 Protocol.

Article 1(4) of the 1996 Protocol defines “dumping” as “any deliberate disposal into the sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea...”, but does not include “the disposal into the sea of wastes or other matter incidental to, or derived from the normal operations of vessels, aircraft, platforms or other man-made structures at sea and their equipment, other than wastes or other matter transported by or to vessels, aircraft, platforms or other man-made structures at sea, operating for the purpose of disposal of such matter or derived from the treatment of such wastes or other matter on such vessels, aircraft, platforms or other man-made structures...”. Based on the above definitions, Liu and Hoskin identified three aspects that need to be further discussed with regard to whether the discharge of nuclear wastewater from Japan is considered dumping.

Firstly, “Wastes or other matter” means “material and substance of any kind, form or description”.⁵⁴ Clearly, nuclear wastewater is included in this broad definition. Furthermore,

⁵¹ Yoshifumi Tanaka, *The International Law of the Sea* (Cambridge, United Kingdom: Cambridge University Press, 2023), 357.

⁵² Ibid.

⁵³ “Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter,” International Maritime Organization, accessed August 9, 2023, <https://www.imo.org/en/OurWork/Environment/Pages/London-Convention-Protocol.aspx>.

⁵⁴ 1996 Protocol, Article 1 (8).

Article 4(1) stipulates “Contracting Parties shall prohibit the dumping of any wastes or other matter with the exception of those listed in Annex 1”, and radioactive substances not be listed in Annex 1, thus, the 1996 Protocol prohibit the dumping of radioactive substances.

Secondly, with regard to “other man-made structures”, neither the Convention nor the Protocol gives a clear and precise definition or scope. Thus, it raises the issue, “whether pipeline discharges from land are covered by the scope of the London Convention and its Protocol”.⁵⁵ Wacht argues that:

“[b]ased on the discussion whether the discharge via land-based pipelines may be qualified as dumping, the IMO Legal Affairs and External Relations Division concluded that there is, due to a lack of guidance in UNCLOS, no clear borderline between the scope of Article 207 and the scope of the definition of dumping as laid down in Article 1(5)(a) and in the London Dumping Convention/1996 London Protocol with regard to this issue. Therefore, a mutual exclusiveness of the respective scope could be denied. Thus, pipelines could be qualified as ‘other man-made structures at sea’ within the meaning of the ‘dumping’.”⁵⁶

Furthermore, professor Tanaka finds that “the IMO takes the view that Parties to the London Convention/Protocol could decide that outfall pipes are ‘other man-made structures at area’ within the meaning of the definition of ‘dumping’ in the London Dumping Convention and Protocol and take action accordingly”.⁵⁷ Due to the fact that the original document cannot be found on the official website of IMO or in its resource library, this thesis does not assumed that Parties have the right to themselves decide on an individual basis if the pipelines can be included in the scope of ‘other man-made structures at sea’, but rather that this is a matter that should be discussed and negotiated by all the Parties to the Convention. In so doing, the interpretation of the pipeline built in Fukushima for the discharge of nuclear wastewater is in the hands of all the Parties to the London Convention/1996 Protocol. They might agree that pipelines were ‘other man-made structures at sea’, then Japan’s discharge of nuclear

⁵⁵ Yoshifumi Tanaka, *The International Law of the Sea* (Cambridge, United Kingdom: Cambridge University Press, 2023), 358.

⁵⁶ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1384.

⁵⁷ Yoshifumi Tanaka, *The International Law of the Sea* (Cambridge, United Kingdom: Cambridge University Press, 2023), 358.

wastewater through a pipeline might meet the definition of ‘dumping’, however, no agreement has been reached so far.

Thirdly, “Sea” means “all marine waters other than the internal waters of all States, as well as the seabed and the subsoil thereof; it does not include sub-seabed repositories accessed only from land”.⁵⁸ Liu and Hoskin believes the argument from Keith, which is that “Sub-seabed repositories is usually referred to the concept of burying radioactive waste in deep ocean sediments; and the most widely proposed deep geological disposal is for a mined repository comprising tunnels or caverns into which packaged waste would be placed.”⁵⁹ Considering that Japan will discharge nuclear wastewater directly into marine waters, rather than burying it under the deep seabed, it does not meet the exclusion in the definition.⁶⁰ The uncertainty here is whether the length of the pipeline extends beyond the baseline of the territorial sea. According to the information from Japan’s coast guard, the area around Fukushima Daiichi Nuclear Power Plant applies the low-water line as baseline.⁶¹ If the end of the undersea tunnel is still within the scope of internal waters of Japan, and the Parties to the London Convention/1996 Protocol agree that the pipeline is a man-made structure under the definition of “dumping”, then according to Article 7(2) of 1996 Protocol, “Each Contracting Party shall at its discretion either apply the provisions of this Protocol or adopt other effective permitting and regulatory measures to control the deliberate disposal of wastes or other matter in marine internal waters where such disposal would be ‘dumping’ or ‘incineration at sea’ within the meaning of article 1, if conducted at sea.” Japan can still take this behavior as dumping to regulate. If the end of the undersea tunnel is in the scope of territorial sea, and the Parties to the London Convention/1996 Protocol agree that the pipeline is a man-made structure under the definition of “dumping”, then it falls within the definition of “dumping”.

On the basis of the analysis above, there are two uncertainties in determining whether Japan’s discharge of nuclear wastewater is dumping, one being whether the pipeline is part of “other

⁵⁸ 1996 Protocol, Article 1 (7).

⁵⁹ Dan Liu and Mark Hoskin, “Contemporary International Law:Regulating the Upcoming Fukushima Radioactive Wastewater Discharge,” *Ocean & Coastal Management* 234 (March 1, 2023): 106452, <https://doi.org/10.1016/j.ocecoaman.2022.106452>.

⁶⁰ Ibid.

⁶¹ “Maritime Intelligence Department, Japan Coast Guard,” Information on the sea area of jurisdiction - Japan’s territorial waters | Maritime Intelligence Department, Japan Coast Guard, accessed June 29, 2023, <https://www1.kaiho.mlit.go.jp/ryokai/ryokai.html>.

man-made structures at sea”, and the other being whether the length of the pipeline exceeds the baseline of the territorial sea. Therefore, we can only say that Japan’s discharge of nuclear wastewater into the sea may meet the definition of “dumping” under the London Convention/1996 Protocol, but a degree of uncertainty remains.

With regard to the three points as mentioned above, the rules of 1972 London Convention are more lenient. Although the definition of “Wastes or other matter” is the same as in the 1996 Protocol, however, according to Article 4 (1), “ In accordance with the provisions of this Convention Contracting Parties shall prohibit the dumping of any wastes or other matter in whatever form or condition except as otherwise specified below: the dumping of wastes or other matter listed in Annex I is prohibited”, which means the Convention only prohibits the dumping of high-level radioactive waste or radioactive matter defined by IAEA as unsuitable for this form of disposal, while allowing the dumping of low-level radioactive waste in accordance with IAEA guidelines.⁶² While later amendments have also prohibited the dumping of low-level radioactive material,⁶³ the provisions of the 1996 Protocol remain more stringent than those of the London Convention.

The definition of “Sea” does not include “the sea bed and the subsoil”, nor is there any reference to “it does not include sub-seabed repositories accessed only from land”. Furthermore, there is no rule providing for the possibility for Contracting Parties to apply, at their discretion, the provisions of the Convention to control the intentional disposal of wastes or other matter in their internal waters.

The definition of “dumping” does not include “any storage of wastes or other matter in the seabed and the subsoil thereof from vessels, aircraft, platforms or other man-made structures at sea; and any abandonment or toppling at site of platforms or other man-made structures at sea, for the sole purpose of deliberate disposal.”, but both treaties are alike in that neither explains “other man-made structures at sea”. According to Tanaka, this definition calls for two comments:

⁶² Dan Liu and Mark Hoskin, “Contemporary International Law:Regulating the Upcoming Fukushima Radioactive Wastewater Discharge,” *Ocean & Coastal Management* 234 (March 1, 2023): 106452, <https://doi.org/10.1016/j.ocecoaman.2022.106452>.

⁶³ “Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter,” International Maritime Organization, accessed August 9, 2023, <https://www.imo.org/en/OurWork/Environment/Pages/London-Convention-Protocol.aspx>.

“First, ‘dumping’ means any deliberate disposal at sea. Thus, disposal from land cannot be considered as dumping. Second, dumping from vessels is distinguished from vessel-source marine pollution. This is partly because unlike accidental pollution from ships, dumping is always deliberate and usually the purpose of a particular voyage.”⁶⁴

Therefore, in light of the above, it is difficult to determine that the discharge of nuclear wastewater is dumping on the basis of the 1972 London Convention.

In summary, the discharge of nuclear wastewater falls within the definition of pollution from land-based sources. However, it is currently difficult to determine whether the discharge of nuclear wastewater is dumping because of uncertainties. For States Parties to the 1996 Protocol, however, it is more likely than for States Parties to the London Convention that a nuclear wastewater discharge will be found to meet the definition of dumping.

For the remainder of this thesis, it is considered that the discharge of nuclear wastewater can be classified as either land-based pollution or dumping.

4 The rights and obligations of States

Given that the legal nature of nuclear wastewater discharges is likely to be land-based pollution and dumping, this chapter will discuss the obligations of discharging States in relation to these two types of pollution, in addition to general obligations such as the obligation to not cause transboundary harm and the obligation to cooperate. And, in the last section of this chapter, this thesis will provide suggestions to affected States.

International law for the protection of the marine environment consists primarily of Part XII of UNCLOS, the general principles of international environmental law and customary international law, and international tribunals have interpreted and confirmed legal provisions and principles in their judgments.⁶⁵ As mentioned in Chapter 1, the custom, treaties, and soft

⁶⁴ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 24.

⁶⁵ Youngmin Seo, “The Marine Environmental Turn in the Law of the Sea and Fukushima Wastewater,” Redirecting..., 2021, https://heinonline.org/HOL/Page?handle=hein.journals%2Frdint45&div=6&g_sent=1&casa_token=.57-58.

law cannot be viewed in isolation, they interact to form a complex regulatory system.⁶⁶ In particular, in the context of the protection of the marine environment, Part XII of UNCLOS, the general principles of international environmental law, the case law judgments are usually closely linked, complementing and reflecting each other. Thus, Articles from UNCLOS, Principles from 1992 Rio Declaration and important cases will be discussed together in the following analysis.

4.1 The general obligations of the discharging Party

At the global level, the UNCLOS established for the first time a comprehensive legal framework for the protection of the marine environment.⁶⁷ The Preamble of UNCLOS recognizes “recognizing the desirability of establishing through this Convention will contribute to...protection and preservation of the marine environment”, and Part XII provide a general framework for the protection of marine environment. This part includes general provisions, global and regional cooperation, technical assistance, monitoring and environmental assessment and so on. This section will then follow the order of the subsections in Part XII to discuss the obligations of discharging States, and lastly, the precautionary principle will be discussed separately as it is not mentioned in UNCLOS, but it is an important principle for the protection of the marine environment.

4.1.1 General provisions

Section 1 of Part XII includes Article 192 to Article 196, and it sets out general obligations of the protection of the marine environment.

Article 192 clarifies the general obligation of all Parties to protect and preserve the marine environment, and it applies to all maritime areas.⁶⁸ In other words, States have the duty to protect the marine environment not only in areas under their national jurisdiction, such as internal waters and territorial seas, but also in areas beyond national jurisdiction, such as the

⁶⁶ Lavanya Rajamani and Jacqueline Peel, *The Oxford Handbook of International Environmental Law* (Oxford, UK: Oxford University Press, 2021), 420.

⁶⁷ Yoshifumi Tanaka, *The International Law of the Sea* (Cambridge, United Kingdom: Cambridge University Press, 2023), 362.

⁶⁸ *Request for an Advisory Opinion Submitted by the Sub-Regional Fisheries Commission (SRFC) (Advisory Opinion)* ITLOS Case NO 21 (2 April 2015) ITLOS Reports 2015, para. 120.

high seas.⁶⁹ In the *South China Sea Arbitration*, the tribunal states these three points: first, “the ‘general obligation’ under Article 192 extends both to ‘protection’ of the marine environment from future damage and ‘preservation’ in the sense of maintaining or improving its present condition. Article 192 thus entails both the positive obligation to take active measures to protect and preserve the marine environment, and by logical implication, entails the negative obligation not to degrade the marine environment.”⁷⁰ Second, “the corpus of international law relating to the environment, which informs the content of the general obligation in Article 192, this requires that States ‘ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control’.”⁷¹ This obligation to ‘ensure’ is an obligation “of conduct”, not “of result”, as well as an obligation of due diligence, which means “to deploy adequate means, to exercise best possible efforts, to do the utmost, to obtain this result.”⁷² Third, “the content of the general obligation in Article 192 is further detailed in the subsequent provisions of Part XII, including Article 194, as well as by reference to specific obligations set out in other international agreements, as envisaged in Article 237 of the Convention.”⁷³ In other words, the obligation to protect the marine environment encompass all the obligations set out in the rest of Part XII, such as not cause transboundary harm and cooperation. Thus, the rest of obligations are part of the ‘due diligence’. According to the advisory opinion from ITLOS, ‘due diligence’ is not an obligation that can be simply defined or described, it changes with external factors, “it may change over time as measures considered sufficiently diligent at a certain moment may become not diligent enough in light, for instance, of new scientific or technological knowledge; it may also change in relation to the risks involved in the activity”.⁷⁴ Hence, there

⁶⁹ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1280.

⁷⁰ PCA Case NO.2013-19. The South China Sea Arbitration(Merites), Award of 12 July 2016, para. 941.

⁷¹ Ibid.

⁷² “Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area (Request for Advisory Opinion Submitted to the Seabed Disputes Chamber),” 2011 - ITLOS, 2011, para. 110.

https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_17/17_adv_op_010211_en.pdf.

⁷³ PCA Case NO.2013-19. The South China Sea Arbitration(Merites), Award of 12 July 2016, para. 942.

⁷⁴ “Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area (Request for Advisory Opinion Submitted to the Seabed Disputes Chamber),”

no specific generic standard for ‘due diligence’, but rather case-by-case analyses.

Article 194(1) requires States take all the measures to “avoid pollution by reducing and controlling it, but also measures to prevent future pollution”.⁷⁵ And, it is a procedural rule⁷⁶ and the tribunal in the 2015 *Chagos Marine Protected Area Arbitration* stated that UK was under an obligation to “endeavor to harmonize” its policies with Mauritius.⁷⁷ According to the tribunal, “Article 194(1) is prospective and requires only the United Kingdom’s best efforts.”⁷⁸ In other words, as it only asks States to do their best, it is on a case-by-case basis. Article 194 (2) clarify that States should be a good neighbour, ensure the activities under their jurisdiction or control do not cause damage to other States and their environment, also be cautious about high seas, the common interest of global, do not spread beyond the areas where they exercise sovereign rights.⁷⁹ In a word, States shall take the duty to not cause the transboundary harm. Czybulka summarized that “ this duty generally known as the ‘no harm’ principle, was initially proclaimed in the *Trail Smelter Arbitration*”, and it is “evolved from Principle 21 of the Stockholm Declaration”.⁸⁰ In the *Trail Smelter Case*, the tribunal confirmed that “under the principles of international law, as well as of the law of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.”⁸¹ The Principle 21 of the Stockholm Declaration is the cornerstone of international environmental law, it include two elements: first, “the sovereign right of States to exploit their

2011 - ITLOS, 2011, para 117

https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_17/17_adv_op_010211_en.pdf.

⁷⁵ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1302.

⁷⁶ Ibid, 1305.

⁷⁷ Ibid.

⁷⁸ “Reports of International Arbitral Awards,” Award in the Arbitration regarding the Chagos Marine Protected Area between Mauritius and the United Kingdom of Great Britain and Northern Ireland , 2018, https://legal.un.org/riaa/cases/vol_XXXI/359-606.pdf, para. 539.

⁷⁹ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1305.

⁸⁰ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1305-1306.

⁸¹ “Reports of International Arbitral Awards - United Nations,” Trail smelter case (United States, Canada), 2006, https://legal.un.org/riaa/cases/vol_III/1905-1982.pdf, 1965.

own natural resources”;⁸² second, the obligation not to “cause damage to the environment of other States or of areas beyond national jurisdiction”.⁸³ Furthermore, In the 1996 Advisory Opinion of ICJ on the Legality of the Threat or Use of Nuclear Weapons, the ICJ stressed that “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.”⁸⁴ In a words, the obligation to prevent transboundary harm from hazardous activities is customary international law.⁸⁵

In addition, in the *South China Sea Arbitration*, the tribunal emphasizes that “Articles 192 and 194 set forth obligations not only in relation to activities directly taken by States and their organs, but also in relation to ensuring activities within their jurisdiction and control do not harm the marine environment.”⁸⁶

In this case, although TEPCO is the one to discharge the nuclear wastewater, the Japanese government is still responsible for ensuring that the discharge plan will not cause transboundary harm, as the discharge of nuclear wastewater takes place within the jurisdiction of Japan. However, the Japanese Government is doing the opposite, actively supporting the plan of the TEPCO to discharge nuclear wastewater, knowing full well that it will cause pollution of the marine environment as well as transboundary pollution.

Article 195 includes two elements, one to prevent the transfer of pollution to another area, “ this duty can be formulated in a positive way, the acting State shall contain the pollution within the affected area, as far as possible, and combat it as soon as possible where it

⁸² Sands Philippe, *Principles of International Environmental Law* (London, UK: Cambridge University Press, 2003), 236.

⁸³ Ibid.

⁸⁴ Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion of 8 July 1996, 1996 ICJ, 242.

⁸⁵ Youngmin Seo, “The Marine Environmental Turn in the Law of the Sea and Fukushima Wastewater,” Redirecting..., 2021, https://heinonline.org/HOL/Page?handle=hein.journals%2Frdint45&div=6&g_sent=1&casa_token= 59.

⁸⁶ PCA Case NO.2013-19. The South China Sea Arbitration(Merites), Award of 12 July 2016, para. 944.

occurred”,⁸⁷ and the other to prevent one type of pollution from transforming into another, “it means that the pollution is to be combated at the source (or/and in its original condition).”⁸⁸ Therefore, Japan, as the discharging Party, should leave the nuclear wastewater on land and treat it in other ways, such as separating the radioactive substances from the water and sealing and preserving them for burial in the ground, instead of discharging them into the ocean, which would not only expand the scope of the impact of the contamination (from the land to the ocean), but also change the type of the contamination (from land-based to ocean-based contamination).

4.1.2 Global and regional cooperation

Section 2 of Part XII set out a series of rules regard to cooperation, includes the obligation of notification and exchange of information.

Article 197 sets out “the fundamental duty of States to cooperate on a global and regional basis in the protection and preservation of the marine environment, the inclusion of the terms ‘on a global basis’ and ‘on a regional basis’ indicate that the duty to cooperate applies to all marine spaces whether within or beyond national jurisdiction.”⁸⁹ In its order on provisional measures in the *MOX Plant case*, the ITLOS stressed that “the duty to cooperate is a fundamental principle in the prevention of pollution of the marine environment under Part XII of the Convention and general international law”.⁹⁰ Under the Regional Seas Programme of the United Nations Environment Programme, there are two regional programmes relevant to the area around Japan, one being the Coordinating Body on the Seas of East Asia (COBSEA) and the other being the Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region(NOWPAP).

According to the official website of COBSEA, it is a regional intergovernmental mechanism focusing on the development and protection of the marine environment and coastal areas of

⁸⁷ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1315.

⁸⁸ Ibid.

⁸⁹ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1329.

⁹⁰ *MOX Plant (Ireland v. United Kingdom) Provisional Measures*, Order of 3 December 2001, ITLOS Reports 2001, para. 82.

East Asian Seas with nine member countries, which are Cambodia, People’s Republic of China, Indonesia, Republic of Korea, Malaysia, the Philippines, Thailand, Singapore and Viet Nam.⁹¹ Activities under the mechanism “are guided by the COBSEA Strategic Directions 2018-2022, adopted in 2018, with a focus on addressing land-based marine pollution; strengthening marine and coastal planning and management; and sharing marine environmental management experiences and policies towards strengthened regional governance”.⁹² Member States of COBSEA adopted the Strategic Directions 2018-2022 and a revised Regional Action Plan on Marine Litter (RAP MALI) in 2019 aimed at addressing the marine environment. The action plan consists of four main actions, one of which is ‘Preventing and reducing marine litter from land-based sources’.⁹³

As a part of Regional Seas Programme of the United Nations Environment Programme, NOWPAP was adopted by Democratic People’s Republic of Korea, Japan, People’s Republic of China, Republic of Korea, Russian Federation.⁹⁴ And, the overall goal of the NOWPAP is “the wise use, development and management of the coastal and marine environment to obtain the utmost long-term benefits for the human populations of the region, while protecting human health, ecological integrity and the region's sustainability for future generations”.⁹⁵ Member States of NOWPAP endorsed The NOWPAP Medium-term Strategy (MTS) for 2018-2023 in June 2018, which envisages that by 2025, ‘prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution’.⁹⁶

As noted above, both regional cooperation instruments aim to protect the marine environment and both focus on the prevention and reduction of land-based marine pollution. However, Japan is only a member of NOWPAP and not of COBSA, although most of Japan’s neighbouring countries are members of COBSA, and developing countries such as Cambodia

⁹¹ UN Environment, “East Asian Seas,” UNEP, accessed August 22, 2023, https://www.unep.org/explore-topics/oceans-seas/what-we-do/working-regional-seas/regional-seas-programmes/east-asian?_ga=2.116679942.1646717334.1692707826-113437727.1661173472.

⁹² Ibid.

⁹³ Ibid.

⁹⁴ UN Environment, “Northwest Pacific,” UNEP, accessed August 24, 2023, https://www.unep.org/explore-topics/oceans-seas/what-we-do/working-regional-seas/regional-seas-programmes/northwest?_ga=2.64412527.1110028246.1692882828-113437727.1661173472.

⁹⁵ Ibid.

⁹⁶ Ibid.

and Viet Nam are members of this regional cooperation body. Compared with them, Japan is a developed country with strong economic conditions and advanced technology, and should do better than these developing countries in protecting the marine environment, but Japan has not joined this regional cooperation organization to protect the marine environment in the East Asian Seas together with its neighbors. Furthermore, its discharge plan obviously is in clear violation of the goal of The NOWPAP Medium-term Strategy (MTS) for 2018-2023, and instead of preventing and reducing pollution from land-based sources, it increases and spreads pollution from land-based sources. Therefore, it is difficult to say that Japan has done its due diligence in cooperating with its neighbors to protect the marine environment.

Article 198 sets out “the duty of States to notify other States where the latter are likely to be affected by imminent or actual damage to the marine environment of which the notifying State is aware, this obligation applies to all situations of actual and imminent damage to the marine environment whether or not the State that becomes aware of it itself has responsibility for the situation giving rise to the pollution incident or threat of pollution.”⁹⁷ And, Principle 19 of Rio Deceleration states that “States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse transboundary environmental effect and shall consult with those States at an early stage and in good faith”. In the *Pulp Mills Case*, the Court stressed that “the obligation to notify is intended to create the conditions for successful co-operation between the parties, enabling them to assess the plan’s impact on the river on the basis of the fullest possible information and, if necessary, to negotiate the adjustments needed to avoid the potential damage that it might cause.”⁹⁸ Moreover, in the *Chagos Marine Protected Area Case*, the tribunal concluded that the UK had breached its obligation “to have due regard or to consult” under Article 56(2) by failing to engage sufficiently with Mauritius to demonstrate a conscious balancing of interests and rights in archipelagic waters prior to declaring a marine protected area.⁹⁹ In this regard, the duty to notify and the duty to consult are closely linked, and the duty to notify is not only to inform the States that may be affected by the pollution, but also to

⁹⁷ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1334.

⁹⁸ *Pulp Mills on the River Uruguay* (Argentina v. Uruguay), Judgement of 20 April 2010, para. 113.

⁹⁹ Leifan Wang and Fenghua Li, “State Duty to Cooperate on the Fukushima Nuclear Contaminated Water Release,” *Marine Policy* 136 (February 2022): 104878, <https://doi.org/10.1016/j.marpol.2021.104878>.

prepare for subsequent consultations, since the duty to notify is part of the duty to co-operate, which is preceded by consultations. Therefore, for discharging States, it is important to note that the obligation to notify is not only to notify but also to consult, and accordingly, potentially affected countries have the right to request discharging countries to consult with them after notification. In this case, Japan had informed other countries of its plan to discharge nuclear wastewater through the news media, but had failed to consult and communicate with neighbouring countries after doing so. Although neighbouring countries, such as China and South Korea, have been opposing the discharge plan, there have been no news reports so far indicating that Japan has engaged in dialogue and consultation with these countries, either directly or through regional cooperation organizations or competent international organizations.

Article 200 requires States to “cooperate in undertaking scientific studies of marine pollution and to exchange information that is acquired about marine pollution” in order to prevent, reduce and control marine pollution.¹⁰⁰ Stephens holds the view that this Article “imposes an obligation upon States to cooperate in gathering information on the causes and effects of pollution, in recognition of the fact that the nature of the marine environment means that pollution may have widespread impacts and affect a number of States”.¹⁰¹ In this regard, as analyzed in Chapter 2, nuclear wastewater will be spread to other seas of the world by ocean currents and marine life, so there is no doubt that discharging countries such as Japan need to undertake the obligation of exchanging information with other countries.

As analysis above, with regard to cooperation with other States, the discharging State should not only undertake the obligation to notify, but also need to consult with the notified State and actively exchange information and data on nuclear wastewater discharges with other States.

4.1.3 Technical assistance

Article 202 and 203 of UNCLOS sets out rules for the provision of technical assistance to developing States in particular, but does not limit the right of developed States to ask for help.

Following the announcement of the Government’s basic policy, Japan requested technical assistance from the International Atomic Energy Agency (IAEA) to review the safety of its

¹⁰⁰ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1342.

¹⁰¹ Ibid.

implementation in accordance with the Agency's safety standards.¹⁰² The IAEA accepted Japan's request and subsequently established a task force consisting of IAEA staff members and senior external experts from 11 countries serving in their personal capacity to conduct this safety review under the authority of the IAEA.¹⁰³ In this case, Japan as a developed country, requested technical and monitoring assistance from the IAEA, which did not reject Japan's request and responded promptly. Hence, it is practical for developed States to request assistance from competent international organization. If the discharging State is a developing country, then according to the rules, not only international organizations but also the other developed countries are required to help the State in science, education and technology.

In another aspect, Japan as the discharging State and developed country, should help the affected developing States that want to monitor and reduce the impact of nuclear wastewater but are technologically underdeveloped or do not have the knowledge to do so.

4.1.4 Monitoring and environmental assessment

Article 204, 205 and 206 sets out the obligations of monitoring and environmental impact assessment (EIA). Article 204 requires States to monitor on an ongoing basis the activities they permit or engage in and to assess by scientific means whether those activities pollute the marine environment. Article 206, which is closely linked to Article 204, stipulates that "States to assess potential effects of planned activities on the marine environment".¹⁰⁴ The obligation to monitor the impacts and risks of pollution can actually be characterized as an ongoing Environmental Impact Assessment (EIA).¹⁰⁵ It is worth noting that, as an important element of the prevention principle, this obligation requires environmental impact assessments to be conducted as long as there is a risk of significant harm to the marine environment.¹⁰⁶ In respect of Article 206, the ITLOS Seabed Disputes Chamber, in its 2011 advisory opinion, emphasized that "the obligation to conduct an environmental impact

¹⁰² "IAEA Task Force Sees Progress in Japan's Regulatory Preparations for Planned Water Discharge from Fukushima Daiichi Site," IAEA, March 25, 2022, <https://www.iaea.org/newscenter/pressreleases/iaea-task-force-sees-progress-in-japans-regulatory-preparations-for-planned-water-discharge-from-fukushima-daiichi-site>.

¹⁰³ Ibid.

¹⁰⁴ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1357.

¹⁰⁵ Ibid, 1357.

¹⁰⁶ Ibid, 1370.

assessment is a direct obligation under the Convention and a general obligation under customary international law.”¹⁰⁷ Blitza holds the view that “both provisions aims at providing States with the information necessary to effectively protect the marine environment in line with Article 192 and Article 194”,¹⁰⁸ and they are further linked to section 2 in that EIA reports are required to inform other States, either through public publication or submission to international organizations, and may therefore be considered as an element of the general obligation of States to cooperate in the protection of the marine environment.¹⁰⁹

Back to this case, as reported in the news, in addition to Japan’s own monitoring activities, the IAEA has established a task force to review the discharge plans and related activities of the Government of Japan and TEPCO, and will conduct independent environmental monitoring to corroborate the data published by the Government of Japan and TEPCO.¹¹⁰ And, the Korean government also sent a delegation of experts to Japan in May this year for a site visit. Therefore, except for the discharging State itself, which monitors the process of nuclear wastewater discharges within its jurisdiction, other States that may be affected by the activity could be involved in the monitoring, and relevant international organizations could oversee the monitoring. Considering that Japan will continue to discharge nuclear wastewater for 30 years, and that ALPS has not always operated effectively, as well as the fact that studies by Greenpeace have confirmed the presence of harmful radioactive substances such as cesium in the nuclear wastewater, all of which indicate that Japan’s discharge of nuclear wastewater may cause significant harm to the marine environment, it is advisable for Japan to carry out an EIA. Given that EIA is an element of the obligation of cooperation, neighbouring States could also be involved in the progress of EIA, for instance by monitoring Japan’s work on EIA. Thus, if there is a reasonable basis to believe that the discharge of nuclear wastewater will cause significant environmental harm, then the discharging party will be required to make an environmental impact assessment (EIA).

¹⁰⁷ “Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area (Request for Advisory Opinion Submitted to the Seabed Disputes Chamber),” 2011 - ITLOS, 2011, para 145

¹⁰⁸ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1371.

¹⁰⁹ Ibid.

¹¹⁰ “New IAEA report focuses on domestic regulation of Japan’s Fukushima Daiichi “treated water” discharge program | | UN News,” United Nations, May 4, 2023, <https://news.un.org/zh/story/2023/05/1117627>.

4.1.5 Precautionary principle

Although the precautionary principle is a very important principle in international environmental law, it is not mentioned in UNCLOS as it was not established in international law until after the adoption of UNCLOS.¹¹¹ This principle can be found in Principle 15 of Rio Declaration, “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation”. According to Sands, this principle “aims to provide guidance in the development and application of international environmental law where there is scientific uncertainty”.¹¹² Kojima summarized that “the approach became a legally binding obligation under Article 5(c), Article 6, and ANNEX II of the 1995 UN Fish Stocks Agreement and Article 3(1) of the 1996 Protocol to the London Convention.”¹¹³ Further, in the Advisory Opinion in 2011, the Deep Seabed Chamber of ITLOS stressed that “the precautionary approach has been incorporated into a growing number of international treaties and other instruments, many of which reflect the formulation of Principle 15 of the Rio Declaration. In the view of the Chamber, this has initiated a trend towards making this approach part of customary international law.”¹¹⁴

In this regard, the 2018 Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean (CAOF Agreement) can provide a useful example for this case. In order to fill a gap in the legal regime for fisheries in the high seas portion of the Arctic, the Arctic five and four other States (China, Iceland, Japan and South Korea) and the European Union imposed a temporary moratorium on unregulated commercial fishing in the Central Arctic Ocean.¹¹⁵ The

¹¹¹ Chie Kojima, “Integration of General Principles of International Environmental Law into the Law of the Sea: Assessment and Challenges,” *Marine Policy* 149 (2023): 105497, <https://doi.org/10.1016/j.marpol.2023.105497>.

¹¹² Sands Philippe, *Principles of International Environmental Law* (London, UK: Cambridge University Press, 2003), 267.

¹¹³ Chie Kojima, “Integration of General Principles of International Environmental Law into the Law of the Sea: Assessment and Challenges,” *Marine Policy* 149 (2023): 105497, <https://doi.org/10.1016/j.marpol.2023.105497>.

¹¹⁴ *Ibid.*

¹¹⁵ Valentin J. Schatz, Alexander Proelss, and Nengye Liu, “The 2018 Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean: A Critical Analysis,” *The International Journal of Marine and Coastal Law* 34, no. 2 (2019): 195–244, <https://doi.org/10.1163/15718085-23342015>.

moratorium will stay in place until the effects of climate change on fisheries in the CAO are better understood and science-based management is in place.¹¹⁶ The CAO Agreement was therefore praised even before it was signed by representatives of the Arctic Five Plus Five and non-governmental organizations as a science-based measure that embodies the precautionary approach.¹¹⁷

Therefore, the nearest neighbouring countries that are the first to be affected by nuclear wastewater could negotiate with Japan through regional cooperation organizations such as NOWPAP (of which Japan is a member) and try to reach an agreement to request Japan to suspend the discharge of nuclear wastewater. Indeed, to date, no one knows for sure how much impact nuclear wastewater will have on the marine environment. Scientists' studies are only speculations based on the available information, as the Statement from the United States-based National Association of Marine Laboratories said that "a lack of adequate and accurate scientific data supporting Japan's assertion of safety". Thus, without sufficient data, it is best to suspend such actions for the time being.

4.2 The specific obligations under land-based pollution and dumping

With regard to land-based pollution, Article 207 of UNCLOS has further provisions on this matter. Article 207 includes three obligations: first, the State to develop domestic laws and regulations on land-based sources of pollution that take into account international rules and standards; second, the need to take other measures to control pollution in addition to the development of laws; and third, to cooperate regionally and globally in the development of regional and global rules and to review those rules from time to time.

Based on the decision of Japanese Government to discharge nuclear wastewater into the sea, as an official announcement, it can be assumed that this discharge plan comply with the domestic laws or regulations of Japan, hence, it is fair to say that Japan does not "adopt laws and regulations to prevent, reduce and control pollution from land-based pollution."¹¹⁸

According to report from TEPCO, other than discharge to the sea, there are four options for treating nuclear wastewater: geosphere injection, vapor release, hydrogen release and

¹¹⁶ Ibid.

¹¹⁷ Ibid.

¹¹⁸ UNCLOS, Article. 207(1).

underground burial.¹¹⁹ And “The reality of the Fukushima radioactive water crisis” from Greenpeace, “Discharge is the cheapest option and it furthers the objective of the government to create the false impression that the consequences of the 2011 nuclear disaster are short lived and of limited effect.”¹²⁰ Discharging nuclear wastewater into the ocean is not the only option for TEPCO and the Japanese Government, but the cheapest way, and therefore Japan’s choice to dispose of nuclear wastewater in this way is based on economic rather than environmental interests. Thus, it can be concluded that Japan failed to “take other measures as may be necessary to prevent, reduce and control pollution”.¹²¹

At the regional level, there are two regional cooperation bodies in the area around Japan, which are COBSEA and NOWPAP. As analyzed in 4.1.2, Japan is not a member of COBSEA, but most of its neighbors are members of this regional programme, including developing countries. And, Japan’s discharge plan violates The NOWPAP Medium-term Strategy (MTS) for 2018-2023. Further, according to Jesus, “Japan’s neighbors have stronger national laws against pollution by land-based sources than Japan”.¹²² Japan has adopted several laws to protect the marine environment, such as the Marine Control Law, the Waste Disposal and Public Cleansing Law, and the International Convention on Oil Pollution Preparedness, Response and Cooperation was adopted and integrated into its national law.¹²³ But, “none of these national laws included any provisions regulating or restricting land-based pollution of the marine environment.”¹²⁴ In contrast, both China and South Korea have adopted stricter legal regulations to limit pollution from land-based sources.¹²⁵ All the three points indicates

¹¹⁹ Victoria Cruz-De Jesus, “Preserving the Sea in a Radioactive World: How Japan’s Plan to Release Treated Nuclear Wastewater into the Pacific Ocean Violates UNCLOS,” Hein Online, 2022, <https://digitalcommons.wcl.american.edu/cgi/viewcontent.cgi?article=2110&context=auilr>. 1026.

¹²⁰ Shaun Burnie, “The Reality of the Fukushima Radioactive Water Crisis - Greenpeace,” The reality of the Fukushima Radioactive Water Crisis, October 2020, https://www.greenpeace.org/static/planet4-japan-Stateless/2020/10/5768c541-the-reality-of-the-fukushima-radioactive-water-crisis_en_summary.pdf.

¹²¹ UNCLOS, Article. 207(2).

¹²² Victoria Cruz-De Jesus, “Preserving the Sea in a Radioactive World: How Japan’s Plan to Release Treated Nuclear Wastewater into the Pacific Ocean Violates UNCLOS,” Hein Online, 2022, <https://digitalcommons.wcl.american.edu/cgi/viewcontent.cgi?article=2110&context=auilr>. 1027.

¹²³ Ibid, 1028.

¹²⁴ Ibid.

¹²⁵ Ibid.

that Japan does not “endeavor to harmonize” its policy in regional level.¹²⁶ And, this discharge plan also reflects that Japan “did not endeavor to establish global or regional rules ,but actively decided to ignore established global and regional agreement.”¹²⁷

With regard to dumping, Article 210 of UNCLOS sets out the provisions. Compared to Article 207, in addition to the adoption of domestic laws and regulations on dumping, take other measures to control pollution, and cooperate regionally and globally in the development of regional and global rules and to review those rules from time to time. There is one more requirement need to be noted, that is “national laws, regulations and measures shall be no less effective in preventing, reducing and controlling such pollution than global rules and standards.”¹²⁸ Shiao Zhang in his paper “A review of International Legal Obligations of Fukushima Nuclear Contaminated Water Discharge Plan” finds out that, The Report of the United Nations Secretary-General on the Law of the Sea to 49th Session of UNGA points out that “ in accordance with articles 210 and 216, Parties to the Convention on the Law of the Sea will now be legally bound to enact and enforce measures which must be no less effective than those taken under the London Convention.”¹²⁹ And correspondingly, in the Seventeenth Consultative Meeting of Contracting Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Parties confirmed that “such States Parties were not only bound to adopt requirements consistent with the current London Convention 1972 but also with further amendments adopted thereto.”¹³⁰ Therefore, the global rules and standards referred to in Article 210(6) are primarily laid down in the London Dumping Convention and its 1996 Protocol.¹³¹ And, the Meeting confirmed that “UNCLOS is without prejudice too stricter rules that may be adopted among the parties thereto.”¹³² Thus,

¹²⁶ Ibid, 1027.

¹²⁷ Ibid, 1029.

¹²⁸ UNCLOS, Article. 210(6).

¹²⁹ *Report of the United Nations Secretary-General on the Law of the Sea to 49th Session of UNGA* (UNDoc.A/49/631), 1994, para. 84.

¹³⁰ *Report of the Seventeenth Consultative Meeting* (LC 17/14), 1994, para. 2.5.

¹³¹ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1418.

¹³² *Report of the Seventeenth Consultative Meeting* (LC 17/14), 1994, para. 2.6.

States are obligated to respect international minimum standards, so that they cannot adopt less effective national legislation, but are free to enact stricter instruments.¹³³

As mentioned in Chapter 3, for discharging States such Japan, which is a Party to both the 1972 London Convention and the 1996 Protocol, the 1996 Protocol is required as an international standard since it supersedes the 1972 London Convention. Nevertheless, other States that are Parties only to the 1972 London Convention need only take that treaty as the international standard on dumping. As the 1996 Protocol prohibits the dumping of all radioactive substances at sea, it is important that discharging States, at a minimum, to adopt domestic legislation on dumping that is consistent with the requirements of the Protocol. In addition, the 1996 Protocol gives Parties discretion to adopt strict regulations in their internal waters. Thus, if discharging States wish to do so, the 1996 Protocol already provides guidance to them. In this case, it is more likely that its discharge of nuclear wastewater would fall within the definition of dumping, regardless of whether the pipeline terminated in its territorial sea or in its internal waters.

Based on the above analysis, it is obvious to find that UNCLOS has more stricter requirements about dumping, States must adopt laws and regulations at least the same standards with global minimum level, even can be more stricter. However, when confronted with land-based sources of pollution, UNCLOS only requires States to take international standards into account, and their application is not mandatory.

4.3 The right for affected States to bring the dispute to international judicial institutions

Based on the analysis in the previous two sections, since Japan would be in breach of its obligation to the protection of marine environment, the affected States could resort to the international judicial institutions in accordance with Part XV of UNCLOS to settle the dispute.

¹³⁴ According to Article 287, States can choose following means for the settlement of the dispute: (1) the International Tribunal for the Law of the Sea established in accordance with

¹³³ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1418.

¹³⁴ Eugene Cheigh, "A Regional Cooperative Regime Should Be Established to Respond to the Radioactive Water Disposal Plan from Fukushima," Heinonline, 2021, https://heinonline-org.mime.uit.no/HOL/Page?lname=&public=false&collection=journals&handle=hein.journals%2Fdenilp50&men_hide=false&men_tab=toc&kind=&page=67.

Annex VI; (2) the International Court of Justice; (3) an arbitral tribunal constituted in accordance with Annex VII; (4) a special arbitral tribunal constituted in accordance with Annex VIII for one or more of the categories of disputes specified therein. However, in the case of clause 3 and clause 5, the arbitration in accordance with Annex VII is the only option.¹³⁵ In addition, the affected States can request for provisional measures in accordance with Article 290 to prevent serious harm to the marine environment after duly submission of the dispute.¹³⁶ Liu and Hoskin argues that the provisional measures can require Japan not to discharge the radioactive wastewater until the case has been heard, order Japan to consult with the affected States such as Korea and China, and to carry out an environmental impact assessment.¹³⁷ In this regard, the *1974 Nuclear Tests Case* can provide a useful example for the affected States interested in finding provisional measures.¹³⁸

During the period from 1966 to 1972, the French Government has carried out a set of atmospheric nuclear tests centered on Mururoa in the South Pacific.¹³⁹ In 1973, France further planned to conduct aerial nuclear tests. In view of this, Australia requests the International Court of Justice to order France not to conduct further nuclear tests in the region, New Zealand requests the Court to adjudge and declare that the fallout of radioactive particles resulting from nuclear tests conducted by the French Government in the South Pacific region constitutes a violation of New Zealand's rights under international law.¹⁴⁰ Australia and New Zealand have also simultaneously requested the Court to indicate provisional measures of protection by ordering France to cease all aerial nuclear testing pending the judgement of the International Court of Justice.¹⁴¹ In this case, the Government of Australia's application enumerated three grounds for the illegality of the French nuclear tests: (1) the prohibition of atmospheric nuclear tests is a "universal" statute, the breach of which would give all States in the international community standing to sue; (2) the French nuclear tests infringed the rights

¹³⁵ Ibid.

¹³⁶ Ibid.

¹³⁷ Dan Liu and Mark Hoskin, "Contemporary International Law:Regulating the Upcoming Fukushima Radioactive Wastewater Discharge," *Ocean & Coastal Management* 234 (March 1, 2023): 106452, <https://doi.org/10.1016/j.ocecoaman.2022.106452>.

¹³⁸ Ibid.

¹³⁹ "France Nuclear Tests Case," France Nuclear Tests Case-Research Institute of Environmental Law of Wuhan University , February 10, 2017, <http://www.riel.whu.edu.cn/view/5023.html>.

¹⁴⁰ Ibid.

¹⁴¹ Ibid.

of the State and its nationals who were exposed to the great danger they posed, in particular, the radioactive particles caused by the nuclear tests, which were carried out without descending into the territory of the Plaintiffs, seriously infringing their rights to territorial sovereignty and sovereignty and independence; and (3) the French nuclear tests, which have caused serious obstruction to the navigation of ships and aircraft on and over the high seas, and the serious pollution of the high seas by radioactive substances, constitute a major violation of the freedom of the high seas.¹⁴² The Government of New Zealand, in addition to citing the French nuclear tests as a violation of two “universal” regulations, namely, the “prohibition of nuclear tests in the atmosphere” and the “prohibition of contamination of the human environment”, stressed that the French nuclear tests had seriously infringed upon New Zealand’s territorial sovereignty and health of its population.¹⁴³

By two Orders of 22 June 1973, the Court, at the request of Australia and New Zealand, required that France should, pending the judgment of the Court, cease to carry out nuclear tests causing radioactive fall-out on Australian or New Zealand territory.¹⁴⁴ It was made very clear that States must not cause significant harm to other States in the conduct of activities that are not prohibited by international law and that they are free to make use of their own resources. Since France had declared in various public Statements its intention not to conduct any further atmospheric nuclear tests after the completion of 1974 series of nuclear tests, and the objectives of New Zealand and Australia had already been achieved, the Court made no decision in its Judgments.¹⁴⁵

There are two points worth noting here. First, the Government of New Zealand alleges that each of the series of French nuclear tests has added to the radio-active fall-out in New Zealand’s territory, whereas the basic principles applied in this field by international authorities are that any exposure to radiation may have irreparable, and harmful, somatic and genetic effects and that any additional exposure to artificial radiation can be justified only by the benefit which results.¹⁴⁶ And the uncertain physical and genetic effects to which contamination exposes the people of New Zealand causes them acute apprehension, anxiety

¹⁴² Ibid. Nuclear tests (Australia v. France), Order of 22 June 1973, para.23.

¹⁴³ Ibid.

¹⁴⁴ Nuclear tests (New Zealand v. France), accessed August 7, 2023, <https://www.icj-cij.org/case/59>.

¹⁴⁵ Ibid.

¹⁴⁶ Nuclear tests (New Zealand v. France), Order of 22 June 1973, para. 23.

and concern.¹⁴⁷ This was made in the absence of clarity about the specific impact of nuclear testing on New Zealand's environment, and the Tribunal did not reject New Zealand's claim. In fact, the emergence of environmental problems tends to be a cumulative process, and since environmental problems are too variable in time and space, their emergence and development are slow and latent, and owing to the limitations of scientific and technological development, it is often difficult for human beings to detect and understand in a timely manner the long-term impacts and eventual results of substances or behaviors that endanger the environment.¹⁴⁸ Therefore, the consequences of nuclear contamination will be felt over a long period of time, and it is not possible to accurately measure in the short term the order of magnitude of the harm caused to the environment.¹⁴⁹ In the same way that the impacts of nuclear wastewater on the marine environment are cumulative, so it is difficult for affected States to give precise evidence of the specific hazards that nuclear wastewater poses to them, especially in the short term. However, the residents of the affected States had already expressed concern and anxiety about nuclear wastewater before it caused cumulative harm to the marine environment, and although they did not know exactly how harmful the radioactive substances would be to marine life or human beings, they knew that the oceans were a connected whole, and that the ocean currents and marine organisms would carry these radioactive substances to the waters of their countries. Therefore, the neighbouring States could bring the dispute to international judicial bodies without having a clear indication of how the nuclear wastewater would affect their marine environment, as long as they are aware of the harm that nuclear wastewater can cause to the marine environment and there is national concern and anxiety about the potential harm.

Second, both the Government of Australia and the Government of New Zealand alleged that French nuclear tests violated two "universal" regulations, namely the "prohibition of nuclear tests in the atmosphere" and the "prohibition of contamination of the human environment". Linking to this case, as mentioned in the first section of this chapter, Article 192 applies to all maritime areas, both within and beyond national jurisdiction, which covers the whole ocean.

¹⁴⁷ Ibid.

¹⁴⁸ Canling Liu and Xiang Wang, "Study on International Environmental Law on Accidental Nuclear Wastewater Disposal - A Perspective on the Fukushima Nuclear Wastewater Incident in Japan", *Academic Forum of Nandu (Journal of the Humanities and Social Sciences)*, 2021. 10.16700/j.cnki.cn41-1157/c.2021.05.008.

¹⁴⁹ Ibid.

Further, Tanaka argues that “in light of statements in multiple instruments and State practice, it would be fair to say that the obligation to protect and preserve the marine environment under Article 192 reflects a rule of customary international law.”¹⁵⁰ thus, the obligation to protect the marine environment under Article 192 can be considered as an obligation erga omnes.¹⁵¹ In other words, protection of the marine environment is in the common interest of all States. Therefore, not only the neighbouring affected States of the discharging Party, but also the other States could bring the dispute to international judicial bodies.

5 Gaps in the existing system

5.1 Gaps in the legal rules related to land-based pollution

Land-based sources are responsible for approximately 80 per cent of the pollution of the oceans and affect the most productive areas of the marine environment.¹⁵² However, because of the close link between land-based pollution and the industrial and agricultural situation of a State, and the industrial and agricultural development is contribute to the State’s economy, States did not wish to commit themselves to strict international rules and regulations on land-based pollution as compared to their commitment with respect to other sources of marine pollution.¹⁵³ And, international controls on land-based pollution could limit the sovereignty of State, since State sovereignty includes the right to control land-based sources of pollution in its territory as it may consider appropriate.¹⁵⁴ Therefore, it is clear that the main intention of States is to regulate land-based marine pollution on a national or regional basis rather than globally.¹⁵⁵

¹⁵⁰ Yoshifumi Tanaka, “The Legal Consequences of Obligations Erga Omnes in International Law,” *Netherlands International Law Review* 68, no. 1 (2021): 1–33, <https://doi.org/10.1007/s40802-021-00184-9>.

¹⁵¹ Ibid.

¹⁵² UN General Assembly, Oceans and the Law of the Sea: Report of the Secretary-General, 18 August 2004, A/59/62/Add.1, p.29, para.97.

¹⁵³ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1381.

¹⁵⁴ Daud Hassan, *Protecting the Marine Environment from Land-Based Sources of Pollution: Towards Effective International Cooperation* (London, UK: Routledge, 2017), 44.

¹⁵⁵ Alexander Proelss et al., *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, 2017), 1381.

UNCLOS classifies marine pollution into six categories by classifying the sources of pollution, namely pollution from land-based sources, pollution from seabed activities subject to national jurisdiction, pollution from activities in the Area, pollution by dumping, pollution from vessels and pollution from or through the atmosphere. While other sources of pollution, such as pollution from ships and dumping, are regulated by international treaties like Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972 London Convention) , International Convention for the Prevention of Pollution from Ships as modified by the Protocol 1978 relating thereto(MARPOL 73/78). To date, there is no special international treaty on land-based sources of pollution, and only several soft law instruments developed by United Nations, of which the two most important are the Montreal Guidelines for the Protection of the Marine Environment against Pollution from Land-Based Sources(Montreal Guidelines) and the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities(GPA).

The UNEP Governing Council adopted in 1985 the Montreal Guidelines, drafted and developed by a working group of experts organized by it.¹⁵⁶ The Montreal Guidelines are intended to provide a broad framework for the development of bilateral, regional and multilateral agreements to protect the marine environment from land-based sources of pollution.¹⁵⁷ Although the Montreal Guidelines reaffirmed the basic obligations established by UNCLOS, they are only recommendatory and not legally binding.¹⁵⁸

At the inter-governmental meeting held in Washington D.C. in 1995, the 108 participating States and the European Commission unanimously adopted the GPA.¹⁵⁹ The GPA aims at “preventing 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” and it is “the only global environment initiative directly addressing the connectivity between

¹⁵⁶ James Harrison, *Saving the Oceans through Law: The International Legal Framework for the Protection of the Marine Environment* (Oxford, UK: Oxford University press, 2017), 69.

¹⁵⁷ Daud Hassan, *Protecting the Marine Environment from Land-Based Sources of Pollution: Towards Effective International Cooperation* (London, UK: Routledge, 2017), 89.

¹⁵⁸ James Harrison, *Saving the Oceans through Law: The International Legal Framework for the Protection of the Marine Environment* (Oxford, UK: Oxford University press, 2017), 69.

¹⁵⁹ UN Environment, “Global Plan of Action (GPA),” UNEP, accessed August 30, 2023, <https://www.unep.org/explore-topics/oceans-seas/what-we-do/working-regional-seas/partners/global-plan-action-gpa>.

terrestrial, freshwater, coastal and marine ecosystems”.¹⁶⁰ Building on GPA, the UNEP launched the Global Wastewater Initiative (GWWI), a multi-stakeholder platform bringing together different United Nations agencies, non-governmental organizations, academia and others to address global wastewater pollution.¹⁶¹ And, GWWI takes a comprehensive view of wastewater, which includes “domestic effluent (black-grey water and faecal sludge), stormwater, industrial effluent, and agricultural effluent and run-off.”¹⁶² Furthermore, the GPA plays an active role in Regional Seas Programmes, cooperating with them to address regional land-based pollution,¹⁶³ for instance, the two regional programme around Japan mentioned in Chapter 4. James believes that “while the GPA provides more guidance to States on what action is necessary to tackle land-based sources of marine pollution, it is, like the 1985 Guidelines, a non-binding instrument and it does not purport to dictate what actions must be taken by States.”¹⁶⁴ In this regard, as analyzed in Chapter 4, in the case of Japan, because soft law is not legally binding, when confronted with the disposal of nuclear wastewater, Japan chose the option that was the cheapest and most advantageous for the country, rather than giving priority to the protection of the marine environment.¹⁶⁵

In addition, as analyzed in last chapter, the regulation regard to the land-based marine pollution in UNCLOS is not like the dumping, require States adopt rules that are at least consistent with international rules. Despite the fact that Article 207 establishes a legal basis for States to control pollution from land-based sources, it is too general.¹⁶⁶ For instance,

¹⁶⁰ Ibid.

¹⁶¹ UN Environment, “Global Wastewater Initiative (GWWI),” UNEP, accessed August 30, 2023, <https://www.unep.org/explore-topics/water/what-we-do/global-wastewater-initiative-gwwi>.

¹⁶² Ibid.

¹⁶³ UN Environment, “Global Plan of Action (GPA),” UNEP, accessed August 30, 2023, <https://www.unep.org/explore-topics/oceans-seas/what-we-do/working-regional-seas/partners/global-plan-action-gpa>.

¹⁶⁴ James Harrison, *Saving the Oceans through Law: The International Legal Framework for the Protection of the Marine Environment* (Oxford, UK: Oxford University press, 2017), 70.

¹⁶⁵ Shaun Burnie, “The Reality of the Fukushima Radioactive Water Crisis - Greenpeace,” The reality of the Fukushima Radioactive Water Crisis, October 2020, https://www.greenpeace.org/static/planet4-japan-Stateless/2020/10/5768c541-the-reality-of-the-fukushima-radioactive-water-crisis_en_summary.pdf.

¹⁶⁶ Daud Hassan, “International Conventions Relating to Land-Based Sources of Marine Pollution Control: Applications and Shortcomings,” International conventions relating to land-based sources of Marine Pollution Control: Applications and shortcomings, Summer 2004,

paragraph 1 requires States “taking into account internationally agreed rules, standards and recommended practices and procedures”, however, it does not specify what are the internationally accepted rules and standards States must give consideration to.¹⁶⁷ Further, it does not provide criteria for determining the propriety of the above standards and measures.¹⁶⁸ And, unlike Article 210, which deals with dumping, Article 207 does not require States parties to comply with minimum international standards.¹⁶⁹

In reality, national implementation is extraordinarily complex, there is no uniform template that States can refer to in order to implement international commitments into national practice, and national implementation involves a wide range of social and economic interests.¹⁷⁰ Therefore, it was not safe to rely solely on national consciousness, land-based pollution was difficult to control mainly because of the conflict between economic development and the protection of the marine environment, with States always placing greater emphasis on economic conditions than on protecting the environment. As long as the harm to the marine environment is not immediate, the State may not pay more attention on it. International involvement might reinforce efforts for land-based pollution control, particularly in regions where countries are all developing as financial and other international assistance can facilitate national control there.¹⁷¹

As analyzed in previous chapters, the discharge of nuclear wastewater not only pollutes the marine environment but also causes transboundary pollution. However, so far, there is no specific standard or threshold to specify the level of pollution or transboundary pollution at which one can be held liable, and a global land-based pollution prevention standard has not yet been established.¹⁷² For example, general terms such as ‘deleterious effects’, ‘harm’, ‘hazards’ and ‘impairment’ are used in UNCLOS, which seem to assume that unacceptable levels of pollution can be identified and predicted, but international law is unclear as to how

<https://www.ecolex.org/details/literature/international-conventions-relating-to-land-based-sources-of-marine-pollution-control-applications-and-shortcomings-ana-072631/>.

¹⁶⁷ Ibid.

¹⁶⁸ Ibid.

¹⁶⁹ Ibid.

¹⁷⁰ Daud Hassan, *Protecting the Marine Environment from Land-Based Sources of Pollution: Towards Effective International Cooperation* (London, UK: Routledge, 2017), 197.

¹⁷¹ Ibid.

¹⁷² Ibid, 44.

this might be done.¹⁷³ Further, cause the absence of a threshold for land-based pollution gives rise to an absence of regulations on what and how to be responsible for causing land-based pollution. Daud observed that “rules dealing with liability for land-based marine pollution damage are very inadequate and their implementation is still unclear and uncertain.”¹⁷⁴ and, addressing these issues “depends on further development of primary international rules and mechanisms on transboundary pollution damage by adopting sufficiently high, detailed and enforceable standards”.¹⁷⁵ Therefore, there is a need for a broad-based, enforceable global treaty that can promote scientific and technological developments in land-based pollution control and prevention standards by fostering cooperative arrangements.¹⁷⁶

Despite the importance of cooperation in controlling land-based sources of pollution, cooperation at the global level is difficult to achieve, owing to a number of factors.¹⁷⁷ One is that there are too many countries and their levels of economic development vary; the second is the wide range of geographic environments between countries and regions; and the third is the differences in political and cultural environments, with varying levels of awareness of the need to protect the marine environment.¹⁷⁸ This thesis suggested that it is possible to start by promoting cooperation at the regional level, and to promote global cooperation as regional cooperation matures. Cooperation at a regional level appears to be less problematic than at the international level.¹⁷⁹ According to Daud, Yamin noted that “the regional approach is well suited to give effect to environmental obligations”, and she argued that “the regional approach: increases the number of common environmental interests; implements global agreements through increased regional actions; facilitates a collective regional approach to donors about funding and success in securing funding; and may be more successful in increasing participation from a broader national constituency than global agreements”.¹⁸⁰ In this regard, regional cooperation in the Baltic Sea can provide a useful reference.

¹⁷³ Ibid.

¹⁷⁴ Ibid, 189.

¹⁷⁵ Ibid.

¹⁷⁶ Ibid.

¹⁷⁷ Ibid, 198.

¹⁷⁸ Ibid.

¹⁷⁹ Ibid.

¹⁸⁰ Ibid.

In the area of Baltic Sea, as surrounding by many countries with large population and many industries, the Baltic Sea used to have serious problem about marine pollution. In order to protect the marine environment, all coastal States adopted a Convention on the Pollution of the Marine Environment of the Baltic (Helsinki Convention) in 1974. Land-based pollution is given special attention, Article 6 includes eight sub provisions providing principles and imposing obligations governing land-based marine pollution.¹⁸¹ At the same time, these coastal States established the Baltic Marine Environment Protection Commission to cooperate in an effective way. And, the Convention was updated in 1992, extended the scope of the Convention to all internal waters as well as the water of the sea itself and the seabed.¹⁸² Through the development and updating of the Helsinki Convention, the coastal States have identified the goal of joint protection of the marine environment of the Baltic Sea and are working together to achieve this goal by strengthening the control of sources of pollution, including land-based sources.

While regional cooperation is necessary, global cooperation also needs to be pursued, as global and regional cooperation are complementary and mutually reinforcing.¹⁸³ Hassan believes that the best approach is to build up an interlinking arrangement of regional and global agreements based on pro-active cooperation among States.¹⁸⁴

With regard to the existing regime on land-based sources of pollution, there are three main problems: first, there is no specific global treaty, that is, there is no legally binding instrument; second, the provisions of UNCLOS are too broad to provide effective guidance and constraints; and third, there is no globally harmonized criterion on “thresholds”. To solve these problems, global cooperation is needed to discuss the development of relevant treaties, however, considering the difficulty of global cooperation, this thesis suggests starting with the establishment of regional cooperation and slowly extending to global cooperation.

¹⁸¹ Qing-nan Meng, *Land-Based Marine Pollution: International Law Development* (London, UK: Graham & Trotman, 1987), 111.

¹⁸² “The Helsinki Convention,” HELCOM, accessed August 2, 2023, <https://helcom.fi/about-us/convention/>.

¹⁸³ Daud Hassan, *Protecting the Marine Environment from Land-Based Sources of Pollution: Towards Effective International Cooperation* (London, UK: Routledge, 2017), 199.

¹⁸⁴ *Ibid*, 198.

5.2 Gaps in the legal rules related to dumping

As discussed in chapter 3, the controversy over whether or not to dump wastes is a manifestation of the loopholes in the law, which gives Japan an opportunity to evade its legal responsibility under dumping treaties.

There are two legally binding international treaties that regulate dumping compared to land-based marine pollution, and they have more restrictive provisions on the dumping of radioactive substances. However, there is still a gap in the system, the lack of a detailed definition of “other man-made structures at sea”. The International Maritime Organization has left it to the States Parties to address this issue, yet so far no State Party has come forward to initiate discussions and negotiations on this issue. The difficulty lies in the fact that countries are generally reluctant to address this issue if there is no personal interest involved, and Japan, as the discharging Party, would like to see “other man-made structures at sea” interpreted in its favor, and the current ambiguity is actually very favorable to discharging Party. Another point is that the States Parties to the London Convention and its Protocols are a small minority in the world, and not the majority of the world’s States have signed up to the Convention, so that even if the current States Parties were to discuss an outcome, it might be rejected by the States that join later because they have not been involved in making their views known. So actually these difficulties are closely linked to international cooperation. Therefore, this thesis suggests that if these problems are to be avoided, it would be better to have a formal explanation from the side of the International Maritime Organization. As the competent international body, the International Maritime Organization can more easily convene the contracting Parties for consultation and discussion and listen to the views of all countries, and it can also invite the participation of experts in the relevant industries for scientific decision-making.

6 Conclusion

In the tenth year after the Fukushima nuclear power plant accident caused by the Great Earthquake in Japan, the Japanese government announced that it would discharge nuclear wastewater into the sea in 2023, which is this year. According to recent news, Japan has completed an undersea pipeline and is preparing to officially discharge nuclear wastewater into the sea through the pipeline at the end of this month, which is expected to last for 30 years.

As the second level seven accident in the history of nuclear accidents, Fukushima, however, did not choose to control the spread of radioactive substances through the construction of a sarcophagus, as was the case at the Chernobyl nuclear power plant, but chose to increase the spread of radioactive substances by discharging them into the sea, which in turn affected all parts of the globe, putting the global marine environment at risk from radioactive materials.

The construction of submarine pipelines by Japan for the discharge of nuclear wastewater has created controversy in defining the legal nature of nuclear wastewater discharges. Although it has been established that the discharge of nuclear wastewater is a land-based source of pollution under UNCLOS, there are several uncertainties in the discussion of whether it is a dumped waste, first, whether “other man-made structures in the sea” includes pipelines, and secondly, whether the length of the pipelines exceeds the baseline of the territorial sea of Fukushima.

Although it cannot be said with certainty that the discharge of nuclear wastewater into the sea constitutes dumping, the discharging State (Japan) cannot evade its legal responsibility. As Party to UNCLOS, States should take the responsibility to protect and preserve the marine environment. And, States should be a good neighbour, ensure the activities under their jurisdiction or control do not cause damage to other States and their environment. Further, all measures should be taken to prevent, reduce and control pollution of the marine environment from any source. Discharging States should also actively participate in international cooperation by notifying other States in a timely manner when pollution will harm or has harmed their marine environment and by initiating the exchange of information and data. An environmental impact assessment is made prior to the discharge of nuclear wastewater, which is also continuously monitored during the discharge process, and these reports are regularly submitted to the competent international organizations. Last but not least, to formulate and implement national laws and regulations in accordance with internationally recognized standards in order to prevent, reduce and control pollution. Neighboring affected countries of the discharging State and other countries in the world can actively cooperate not only in monitoring the discharging State, but also in seeking help from international judicial bodies, for example, by submitting a request for provisional measures to stop the discharge of nuclear wastewater.

The legal regime is not a blank slate when it comes to nuclear wastewater discharges, but there are still some gaps that need to be filled. For example, with regard to land-based sources

of pollution, there were no global binding standards or treaties, and with regard to dumping, there was no clear interpretation of “other man-made structures at sea”. These gaps need to be filled by the cooperation of countries around the globe.

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