

# ***Nuclear Waste Dumping and the Improvement of International Legislation for the Protection of the Marine Environment***

## ***-A Perspective on the Dumping of Nuclear Waste into the Sea in Japan***

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**Abstract:** The ocean is a vast and complex ecosystem covering 70% of the Earth's surface, providing various resources and energy for humanity. However, with the development of human society, the function of the ocean has gradually shifted from a "harvesting ground" to a "dumping ground." With large-scale damage to the marine environment, events like the 2011 Japanese nuclear leak and the recent decision by the Japanese Prime Minister to discharge nuclear wastewater into the Pacific Ocean have intensified the discourse on marine environmental protection. Different countries have shown varying stances and attitudes towards these events. This paper explores how individuals should bear national responsibility in nuclear pollution incidents, including the discharge of nuclear wastewater, from the perspective of international marine environmental protection law. The introduction section introduces the research background, methodology, and objectives. The second part discusses the legal analysis of Japan's disposal of nuclear waste into the ocean. The third part presents the improvement of international legislation on marine environmental protection. The fourth part emphasizes the significant impact and global ramifications of nuclear wastewater discharge, urging clarity on the Japanese government's responsibility to safeguard coastal nations and accelerate the safe treatment of nuclear wastewater.

**Keywords:** international marine environmental protection legislation, Japanese nuclear waste disposal, development and improvement

## **1. Introduction**

According to the Japan Meteorological Agency, on March 11, 2011, at around 2:46 PM local time, a magnitude 9.0 earthquake struck the depths of the Sanriku Sea, approximately 25 kilometers below the surface. This earthquake was the most severe ever recorded in Japan and was named the "2011 Tōhoku earthquake" by the Meteorological Agency. It triggered a devastating tsunami that caused immense damage to the northeastern regions of Japan. Among the hardest-hit areas was Rikuzentakata City, which was virtually wiped out, with over 80% of its territory (nearly 5,000 households) submerged in water. Fukushima, located in the northeastern part of Japan, was not spared either. On that day, the Fukushima Daiichi Nuclear Power Plant was suspected to have experienced

a nuclear leak. On the afternoon of March 11, Japanese authorities expanded the evacuation area for residents from a 3-kilometer radius to within 10 kilometers. Subsequent investigations confirmed that due to the earthquake and tsunami, one of the towers supplying power to the nuclear power plant had collapsed due to mudslides. As a result, the external power supply to the nuclear power plant failed, and the emergency generators could not effectively ensure the power supply inside the plant, leading to the loss of cooling functions in Unit 1. Without proper cooling, the fuel rods in the reactor continued to overheat, causing the temperature inside the reactor to rise and the pressure inside the containment vessel to increase, ultimately leading to an explosion in the building. This marked the beginning of the Fukushima nuclear leak accident. Similar to the infamous Chernobyl nuclear power plant incident in April 1986, the Fukushima nuclear leak incident had severe consequences and was rated at the highest level of 7 on the International Nuclear Event Scale (INES). Although the situation gradually stabilized, it wasn't until July 22, 2013, that Tokyo Electric Power Company (TEPCO) stated that radioactive water had leaked from the nuclear power plant since the earthquake and had flowed into the Pacific Ocean. This revelation immediately garnered widespread attention and criticism. On August 20 of the same year, due to the aging of the rubber rings in the storage tanks containing contaminated water, nearly 300 tons of highly radioactive water leaked from outside the storage tanks into the ocean. Given the rapid generation of contaminated water, the difficulty in purifying it, and limited storage space, TEPCO had previously announced that all storage tanks for nuclear waste were expected to be full by the summer of 2022, with the total volume of nuclear wastewater reaching one million tons. In September 2020, Japan's Minister of the Environment, Yoshiaki Harada, announced during a press conference that TEPCO and the Japanese government intended to use a dilution treatment method, purifying the water before discharging it into the Pacific Ocean. Chairman Toyoshi Fuketa and Director-General Tomofumi Tanaka of the Nuclear Regulation Authority of Japan both agreed that discharging contaminated water into the Pacific Ocean was the "only realistic option [1]." On April 13, 2021, Japanese Prime Minister Yoshihide Suga held a cabinet meeting in which it was officially decided to discharge the nuclear wastewater from the Fukushima Daiichi Nuclear Power Plant into the ocean. Two weeks after the nuclear power plant accident, Tokyo Electric Power Company claimed in an interview that, due to the impact of the nuclear leak on the surrounding environment, plutonium, a highly hazardous radioactive element, was detected in the soil around the nuclear power plant for the first time. Plutonium poses the greatest risk to human health as it can persist in human cells for extended periods, leading to genetic damage over time. Additionally, plutonium is chemically stable, with the relatively stable isotope plutonium-244 having a half-life of 80 million years. However, the more commonly produced plutonium-239 has a half-life of 24,100 years, making it difficult to disappear through natural radioactive decay [2]. One year after the Fukushima nuclear power plant accident, a research team from the Japan Atomic Energy Agency conducted a study on the soil in Fukushima. Starting in June 2011, the team conducted a distribution study of four radioactive substances, including cesium-137, in soil up to one meter deep at 11 locations within a radius of 20 to 60 kilometers from the nuclear power plant in Fukushima. The study found that most of the radioactive substances were concentrated within 5 centimeters below the surface, with an assessment that they would penetrate to a depth of 10 to 30 centimeters underground within a year. On March 4, 2021, a report released by an international environmental organization revealed that Japan's government-designated "special decontamination area" still had 85% of its area contaminated with radioactivity. On April 19, due to the discovery of excessive levels of radioactive substances in a landed black rockfish caught off the coast of Fukushima in February, detailed measurements by a prefectural research institution indicated that the concentration of radioactive cesium was 500 becquerels per kilogram, exceeding the national food standard of 100 becquerels per kilogram. The Japanese government subsequently announced the prohibition of selling black rockfish from the Fukushima sea area. According to data from the German marine science research institution,

Japan had accumulated 1.25 million tons of nuclear wastewater over a decade. If all of it were discharged, radioactive substances would spread and contaminate more than half of the Pacific Ocean within 57 days. Within three years, the contamination zone would extend to the waters of the United States and Canada, and within ten years, it would reach global oceanic areas [3]. Before choosing to dispose of nuclear waste in the ocean, Japan considered other methods, such as landfilling. However, disputes over landfilling locations persisted due to conflicts between the central government and local authorities. Ibaraki and Gunma prefectures strongly opposed the disposal of radioactive materials within their territories, causing the landfill project to stagnate. Other prefectures also faced opposition from local residents. To appease the public, the government renamed the “Nuclear Waste Final Disposal Facility” to the “Long-term Management Facility.” Another option is the seabed disposal currently under study in the United States. Although U.S. law prohibits the dumping of highly radioactive nuclear waste into the ocean, the United States has spent over 30 million dollars researching the disposal of nuclear fuel on the ocean floor. This involves sinking canisters containing waste into sediment at depths of 30 to 100 meters on the ocean floor, a location similar to where Japan has chosen to dump nuclear waste in the Pacific Ocean. However, this option is complex and expensive. The Japan Economic Research Center estimated the total cost of reactor decommissioning, decontamination, and compensation for the Fukushima Daiichi Nuclear Power Plant accident to be between 50 trillion and 70 trillion yen. Given Japan’s current financial situation, it is insufficient to cover all subsequent expenses. Wastewater treatment has also been considered in Japan, but in September 2018, TEPCO admitted that the treated water still exceeded the discharge standard for radioactive substances. On September 28, 2018, it was clarified that out of the 890,000 tons stored in the tanks, approximately 750,000 tons exceeded the reference values. Among the 65,000 tons of treated water, the strontium-90 level exceeded the reference value by over 100 times, and another portion exceeded the reference value by 20,000 times. Therefore, the government and TEPCO publicly stated that this treatment plan could not proceed for the time being. In comparison, direct disposal into the Pacific Ocean is a cost-effective and rapid method. According to calculations, if Japan directly dilutes and releases radioactive water into the sea, it would cost between 1.7 billion and 3.4 billion yen and could be completed in 7 years and 4 months [4].

## **2. Legal Analysis of Japan’s Nuclear Waste Disposal Even**

### **2.1. Violation of Fundamental Principles of International Law**

Japan’s government and TEPCO’s method of disposing of nuclear waste have caused international outrage. However, Japan is unlikely to change its policy due to public condemnation. Therefore, scholars and politicians from various countries are searching for relevant conventions to prove that Japan’s actions not only contradict ethical and moral values but also violate the international treaty provisions it has signed, potentially leading to liability for compensation. It is undeniable that Japan, as a signatory to many international conventions on marine protection, has violated the provisions of many conventions, whether in its actions a decade ago when it dumped nuclear waste into the Pacific or in its current decision to dispose of waste. As marine environmental pollution has become increasingly serious in recent years, the world has begun to recognize the importance of marine environmental protection. The system of international marine environmental protection regulations is continually being improved.

### **2.2. Violation of Conventions**

In the mid-20th century, due to the recovery of international trade and the development of industrial industries following World War II, incidents such as oil spills from ocean-going vessels and illegal discharge of wastewater from factories exacerbated the already severe problem of marine pollution.

International organizations began to regulate marine pollution other than oil. The first United Nations Convention on the Law of the Sea established four separate international conventions: the Convention on the High Seas, the Continental Shelf Convention, the Territorial Sea and Contiguous Zone Convention, and the Convention on the High Seas Fisheries and Conservation of Living Resources. These conventions each contain provisions on issues related to pollution prevention and control in the four areas: the high seas, territorial seas, contiguous zones, and continental shelves. Among them, the Continental Shelf Convention stipulates that coastal states need to take maximum speed limits to protect the marine ecosystem from the damage caused by pollutants. Article 25 of the Convention on the High Seas provides, “(a) States shall adopt measures to prevent the pollution of the sea from the disposal of radioactive waste and shall ensure that such waste is not discharged into the sea without being rendered harmless.” However, the language in these four conventions on preventing marine pollution is ambiguous [5]. For example, the Convention on the High Seas does not expressly prohibit the dumping of waste from ships into the ocean or specify clear criteria for marine pollution standards. It only suggests that when disposing of waste, states should consider the standards and regulations established by international organizations and strive to carry out waste disposal as far from land as possible. Therefore, although Japan’s actions do indeed conflict with the provisions of these conventions, no country has yet criticized Japan’s disposal of nuclear waste based on these four conventions. Currently, the basis for the criticism of Japan’s government and TEPCO by governments and scholars from various countries is mainly the United Nations Convention on the Law of the Sea (UNCLOS). Japan is a signatory to UNCLOS, and its provisions from Articles 192 to 23 in Chapter XII contain extensive regulations on the obligations of contracting parties to protect and preserve the marine environment and the rights to exploit natural resources [6]. While countries take measures to prevent, reduce, and control marine environmental pollution, they should also protect the interests of other countries and avoid transferring damage, danger, or one type of pollution into another. If Japan disposes of nuclear wastewater into the Pacific Ocean for its own benefit, it will transfer harm to neighboring coastal countries and even to all of humanity, neglecting the health of humanity as a whole. According to Article 192 of UNCLOS, protecting the marine environment and preserving the ecological balance of the oceans are obligations of contracting parties. As a signatory to the treaty, Japan has an obligation to comply with its provisions. Japan’s actions, both in disposing of nuclear waste and in the current decision, contradict UNCLOS. According to Article 194(2) of UNCLOS, contracting parties are obliged to take all necessary measures to prevent, reduce, and control activities within their jurisdiction or control that may cause harm to the environment of other states or of areas beyond the limits of national jurisdiction. Japan should have used effective means to prevent the effects of the accident from spreading to other countries as soon as the nuclear leak occurred. However, Japan concealed the fact of the nuclear leak, and the government’s announcement of an unreasonable wastewater disposal plan without the consent of other countries has caused international outrage. According to Article 198 of UNCLOS, when a state receives information that an activity may cause pollution of the marine environment and the activity could have effects on the marine environment of other states, it is obligated to notify the states or international organizations that may be affected and take positive measures to reduce the extent of pollution. Japan should have notified the relevant countries immediately after the nuclear leak, but TEPCO concealed the incident for an extended period, and the government’s announcement of an irrational wastewater treatment plan without the consent of other countries has caused international anger. According to Article 210(5) of UNCLOS, all states are prohibited from dumping waste in the territorial sea, exclusive economic zone, and continental shelf. If dumping waste is approved by the competent authority of the coastal state after prior consultation with other countries that may suffer adverse effects, the coastal state can allow waste disposal, but it should manage and control the disposal of waste effectively to prevent cross-border environmental harm. In summary, Japan should have notified relevant countries

immediately after the accident, but TEPCO concealed the nuclear leak for an extended period, and the government's announcement of an irrational wastewater treatment plan without the consent of other countries has caused international outrage. According to Article 235 of UNCLOS, all contracting parties have an obligation to protect and preserve the marine environment, and a state that violates this obligation must bear legal responsibility for its violation.

### **3. Improvement of Legislation for International Marine Environmental Protection**

#### **3.1. Factors Influencing the Improvement of Legislation for International Marine Environmental Protection**

##### **3.1.1. Event-Led Initiatives**

There are various factors that drive the improvement of national legislation for marine environmental protection, and major pollution incidents are direct catalysts for legislation. For example, one of the most severe international incidents to date is the oil pollution incident. In 1989, the Exxon Valdez, an oil tanker owned by the American Exxon Shipping Company, ran aground near Prince William Sound, Alaska, while carrying approximately 200,000 liters of Alaskan crude oil en route to Long Beach, California. Due to this grounding, 8 out of 11 cargo oil tanks and 3 out of 5 large ballast tanks were damaged, resulting in the release of approximately 31,000 cubic meters of crude oil from the vessel's hull.

Due to a delayed response and challenging weather, sea conditions, and complex terrain, the initial containment efforts were slow, allowing the oil to spread. As a result, the spilled oil extended to the Alaska Gulf Coast, reaching as far as 470 nautical miles from the accident site by May 18 of the same year. This incident not only heavily polluted extensive coastal waters but also had a significant impact on the habitats of precious flora and fauna. It caused extensive harm to marine life, such as salmon, sea birds, and marine mammals, and inflicted substantial damage on the United States. This incident marked one of the largest oil pollution events in history.

However, such major environmental pollution incidents are not isolated cases. Statistics indicate that over the past three decades, while the number of oil (including fuel oil) spill incidents has been decreasing globally, the overall volume of oil pollution has not necessarily shown a decreasing trend. In the event of a major accident, a significant amount of oil can still be discharged.

In the wake of the Exxon Valdez incident in Alaska in 1989, the international community thoroughly reflected on the causes of the event and the inadequate post-accident response, which led to extensive marine pollution. Consequently, in 1990, the international community established the "International Convention on Oil Pollution Preparedness, Response and Co-operation," also known as the OPC Convention. The OPC Convention aims to minimize the impact of large-scale oil spills on the marine environment and improve both national and international response systems. It primarily emphasizes the need for oil pollution emergency plans for vessels and prescribes procedures for shipmasters and crew to rapidly notify coastal states in the event of an accident. After an accident, countries are expected to cooperate based on the requirements of the affected state, and it also promotes international collaboration in research and development related to oil pollution prevention and control. Following such incidents, countries are encouraged to establish national systems for responding to accidents (national contingency plans) and negotiate agreements with other countries, as needed.

In summary, major environmental pollution incidents serve as important factors that promote the improvement of legislation in international marine environmental law [7].

### 3.1.2. Technological Advancement and Paradigm Shift

The development of international legal systems for marine environmental protection is closely linked to technological advancement and evolving human perspectives. It is well-known that “technological development” is a double-edged sword. As human activities expand in scope, technology has made life more convenient but has also exacerbated environmental pollution. The Pew Oceans Commission studied pollution in U.S. marine and coastal waters, defining pollution as substances, organisms, or energy (such as sound or heat) released into the environment through human activities that have adverse effects on organisms or the environmental processes upon which they depend. Marine pollution is no exception, representing the adverse effects of human activities on the marine environment [8].

From the perspective of international environmental protection conventions, starting with the 1954 “International Convention for the Prevention of Pollution of the Sea by Oil” aimed at preventing the illegal dumping of oil, to the 1972 “London Convention” that added radioactive substances to the restricted list, and to the 1982 “United Nations Convention on the Law of the Sea,” which comprehensively protects the marine environment, it is evident that as humanity explores and exploits energy technologies for societal benefits, diverse and hard-to-eliminate sources of pollutants are emerging, leading to ongoing degradation of the marine environment.

Of course, “technology” has also contributed to reducing marine pollution. Take, for example, the handling of Japan’s nuclear wastewater. Compared to the nuclear leak incident in 2011, the wastewater treatment technology has matured over the past decade. To minimize pollution, Japan has stated that before discharging nuclear wastewater, it will undergo purification processes to remove most harmful substances. However, due to technological limitations, it may not be possible to completely eliminate radioactive elements. The globalization of the internet has increased public and media interest in the marine environment and marine life, raising awareness and engagement of the public and non-governmental organizations in activities related to managing the marine environment. Further advancements in underwater marine technology provide opportunities for gathering information and fostering international cooperation on marine environmental issues. This, in turn, enhances public understanding of ocean and marine issues, as well as the potential for non-governmental organizations to influence and exert pressure on national marine and ocean management policies and practices.

International legal systems are a compilation of laws enacted by legislative bodies over time and common law and customary law accumulated through judicial or traditional practices. As human society progresses over time, with advancements in the era and technological development, human perspectives inevitably evolve. New concepts must emerge for human society to create corresponding legal systems that support these changes. Therefore, paradigm shifts play a decisive role in the development and improvement of international marine environmental protection legislation. Humanity’s perception of the ocean has transitioned through stages of reverence, exploration, and ultimately exploitation. With increased knowledge of the ocean, pollution has continued to worsen, leading to the formation of diverse and unique legal systems. The international protection of the marine environment has evolved from legislation focused solely on specific sources of pollution, such as oil dumping by ships or land-based garbage disposal, as seen in earlier agreements like the “Territorial Sea and Contiguous Zone Convention” and the “Continental Shelf Convention.” These early systems primarily served the interests of individual countries. However, over time, countries realized that they could no longer protect themselves from the consequences of environmental harm caused by other nations, as the interests of coastal states are often intertwined with the marine environment. Each serious marine pollution incident inflicts severe damage on the fisheries, resources, and environment of coastal states, leading the international community to seek cooperation. Global



treaties such as the “United Nations Convention on the Law of the Sea,” the “Rio Declaration,” and the “Agenda 21” began emphasizing the importance of international cooperation. The “Declaration of the United Nations Conference on the Human Environment” notes that international cooperation can effectively reduce the harm of human activities to the environment.

In conclusion, due to the vast expanse of the oceans, their connection to all nations, and their impact on the safety, health, and economic interests of all humanity, it is essential to amend outdated legal provisions and enhance international cooperation. New types of pollutants arising from technological advancements should be included in international treaties to prevent nations from engaging in environmentally damaging activities due to legal loopholes. International cooperation can prevent and reduce marine pollution and, in the event of pollution, facilitate timely response to maximize effectiveness. International cooperation can take many forms, including bilateral cooperation among nations [9]. For instance, the Japanese government has signed agreements with countries such as Russia, China, South Korea, and the United States on cooperation in the field of environmental protection, aiming to protect and improve environmental aspects such as air and water quality. International organizations formed through the negotiation of specific treaties and agreements are also crucial components of international cooperation. For example, the International Atomic Energy Agency (IAEA) plays a significant role in building a framework for international nuclear safety through the development and publication of safety regulations and standards to prevent permanent environmental contamination caused by radioactive materials. The International Maritime Organization (IMO) supervises compliance with international maritime conventions, ensuring that these conventions have binding effects on participating countries, thus safeguarding the sustainable development of the global marine environment and economy.

## **3.2. Improvement of Legislation for Marine Environmental Protection**

### **3.2.1. Enhancing Domestic Legislation**

Of course, relying solely on comprehensive international treaties cannot address the current crisis of nuclear waste dumping. Domestic laws need to regulate major or potential pollutants to reduce the burden of international pollution.

Currently, when countries are improving their legislation for marine environmental protection, they should primarily consider the following issues:

First, it is necessary to address the lag in lawmaking and the lack of up-to-date legal norms. As mentioned earlier, many of Japan’s domestic laws regarding nuclear waste disposal were formulated only after the Fukushima nuclear power plant accident. This lack of proactive legal regulations left the Japanese government unprepared for the event, and the subsequent handling was far from satisfactory. The construction of the legal framework for marine environmental protection is also incomplete. For example, the current marine laws and regulations have limited coverage and do not align with the rights and obligations granted by international conventions. Laws like Japan’s Harbor Act, Fisheries Harbor and Fishing Ground Development Act, and Coast Act, while effective within their respective domains, cannot effectively address marine pollution prevention and control on a broader scale. Therefore, countries should update their domestic laws for marine environmental protection promptly to efficiently address the issues.

Second, there is a need to standardize the definitions of specialized terms used in international conventions that may differ among countries, leading to different practical effects. Domestic laws of each country should unify the definitions of various specialized terms. Taking “marine environmental pollution” as an example, the definition in the United Nations Convention on the Law of the Sea differs from that in domestic laws of China. The former provides a relatively broad explanation of marine environmental pollution, while China’s domestic laws place more emphasis on the harm to

the marine environment based on the former's definition. This slight difference in wording leads to significant discrepancies in the application of legal provisions, including burden of proof, scope adjustment, and litigation procedures. Therefore, countries should maintain a rigorous attitude in legislation, ensuring legislative consistency to provide a convenient legal environment for law enforcement.

Lastly, countries should align their national legislative standards with international law, prioritizing the prevention of marine pollution over its management, similar to international lawmaking standards. Due to underdeveloped legal systems and weak legal awareness in some countries, their legislative standards are significantly lower than international standards. For example, international conventions only restrict the dumping of sediments corroded by rainwater on land, but China's marine laws allow a broader range of sediment types for disposal. Additionally, international treaties like the United Nations Convention on the Law of the Sea and the London Convention regulate the dumping of radioactive substances into the ocean. However, in some countries, such as Japan, laws related to radioactive pollution are not closely tied to marine law but are primarily found in burial regulations. Therefore, in national legislation, countries should raise their standards for pollutants such as shipborne pollution, plastic waste pollution, domestic and foreign military pollution, and radioactive pollutants, which can pose significant environmental hazards. Harmonizing domestic legislation with international law will facilitate the implementation of international conventions and reduce international marine pollution incidents.

### **3.3. Accountability and Prevention Mechanisms for Marine Pollution**

The first cross-border environmental damage compensation case in the history of international environmental law, the "Trail Smelter Arbitration Case," was resolved through arbitration between the United States and Canada [10]. The case originated from a lead-zinc smelting plant established by Canada near Trail, located just over ten kilometers from the U.S. border. Starting in 1896, the plant released large quantities of sulfur dioxide, causing agricultural damage in the state of Washington, USA. Over several decades, the victims of pollution attempted to resolve the dispute through U.S. domestic courts and the International Joint Commission established under the 1909 "Boundary Waters Treaty between the United States and Canada," but to no avail. The United States and Canada eventually decided to submit the dispute to arbitration and signed an arbitration agreement in 1935. In 1941, the arbitration tribunal issued its decision, holding the Canadian government responsible for the pollution caused by the Trail smelter. Subsequently, cases like the "Corfu Channel Case" (1949), "Lansdowne House Arbitration Case" (1957), "Nuclear Tests Case" (1974), and "Danube River Dam Case" (1997), all played important roles in developing and improving the legal system for cross-border environmental damage compensation.

Regarding Japan's decision to discharge nuclear wastewater, South Korea is considering two procedures, namely, applying for provisional measures and initiating litigation. Both procedures fall under the provisions of the United Nations Convention on the Law of the Sea for dispute settlement and are submitted to the International Tribunal for the Law of the Sea. The system for provisional measures by the tribunal is designed to prevent potential harm to the marine environment before a final ruling is made. In the "Mox Plant Case" heard by the International Tribunal for the Law of the Sea, Ireland believed that the Mox fuel plant located in the United Kingdom could potentially harm its marine ecosystem and fisheries resources. Therefore, Ireland submitted the dispute related to marine environmental protection to the arbitration procedure under Annex VII of the United Nations Convention on the Law of the Sea and simultaneously applied for provisional measures to prevent the Mox plant from commencing operations. However, since there was no direct evidence indicating that substantial harm could occur, the tribunal did not support Ireland's request.



Legal proceedings are not the sole remedy in international law. Proactive measures such as preventive mechanisms and international cooperation are crucial for addressing potential cross-border environmental risks. With the Rio Declaration in 1992 clearly emphasizing the principle of risk prevention, international environmental law shifted its focus from compensating environmental damage to controlling and preventing potential environmental harm and protecting and sustainably utilizing natural resources and ecosystems. Environmental impact assessment procedures were included in the United Nations Convention on the Law of the Sea as a primary means of prevention. Article 206 of the Convention stipulates that if a country reasonably believes that activities planned within its jurisdiction or control may cause significant pollution or significant and harmful changes to the marine environment, it should conduct an assessment of the potential impact on the marine environment to the extent practicable. It should also report the assessment results to the relevant international organizations and all treaty parties. International agreements such as the 1991 “Protocol on Environmental Protection to the Antarctic Treaty,” the 1992 “United Nations Framework Convention on Climate Change,” and the “Convention on Biological Diversity” in 1992 have established environmental impact assessment as a legal procedure.

Regarding international cooperation, the Japanese government needs to engage not only in negotiations with neighboring countries but also in cooperation with various international organizations responsible for specific aspects. In addition to communicating with the International Atomic Energy Agency (IAEA), which is committed to nuclear technology safety and peaceful use, Japan should cooperate with international organizations such as the Food and Agriculture Organization of the United Nations (FAO) responsible for fisheries affairs, the United Nations Environment Programme (UNEP) responsible for the protection and conservation of the marine environment, the International Maritime Organization (IMO) responsible for shipping affairs, and the Intergovernmental Oceanographic Commission responsible for marine scientific research affairs.

#### 4. Conclusion

Currently, the international community is in a phase of rapid development. The ocean provides countless resources and energy sources for humanity, but some countries, in pursuit of economic development, have treated the ocean as their “garbage disposal,” neglecting the protection of the marine environment. Various pollutants entering the ocean have continuously degraded marine ecosystems. The consequences of damaging the marine environment will ultimately be borne by humanity. The Fukushima nuclear leakage incident has already caused enormous environmental damage, leading to species mutations and the death of marine organisms. The decision to dump nuclear waste into the Pacific Ocean for the sake of one’s own interests places global human health and safety at risk. Given the current public opinion trend, it is challenging to change Japan’s decision to dump nuclear waste into the ocean. However, if Japan persists in its unilateral action, it will undoubtedly exert enormous pressure on the global marine environment. Countries and international organizations opposing this decision have begun actively seeking countermeasures. At this stage, most countries are attempting to resolve the issue peacefully through diplomatic channels to prevent the occurrence and worsening of this incident. If Japan continues to act unilaterally, having a comprehensive international marine protection convention becomes necessary to prevent its improper behavior. From a legal perspective, this article proposes recommendations for future human efforts to prevent marine pollution, among other things, providing valuable reference for improving relevant legislation and law enforcement.

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