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Examining marine pollution governance from the perspective of international investment law: theoretical connection, development trends, and China's experience

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Global marine pollution demands effective governance measures, with international investment law playing a crucial role. This study explores ocean pollution governance through international investment law, focusing on two aspects. First, it examines environmental clauses in investment agreements and their influence on host countries' environmental regulatory space. Second, it assesses China's current marine environmental laws and governance practices, highlighting challenges like insufficient legal integration and unclear liability definitions. Findings indicate a shift towards "greening" international investment rules, emphasizing the importance of environmental provisions in managing marine pollution. However, earlier treaties often lacked comprehensive environmental clauses, restricting host nations' regulatory capacities. Accordingly, it is necessary to strengthen multilateral cooperation and refine specific rule innovations. By leveraging investment-rule reform platforms to promote the implementation of marine environmental regulations, the negative impacts of ISDS can be mitigated, ultimately achieving a win-win between investment protection and marine environmental conservation.

KEYWORDS

international investment law, marine environmental governance, environmental clauses, international investment agreements, sustainable development

1 Introduction

The current state of global ocean pollution is one of considerable severity. A variety of pollution sources continuously threaten marine ecosystems, economic industries, and public health. Ocean pollution manifests in multiple ways, including but not limited to severe and widespread contamination and a broad spectrum of affected areas. The primary sources of pollution can be categorized into four distinct types: plastic pollution, oil spills, heavy metal contamination, and the impact of deep-sea mining. The severity of ocean pollution is evidenced not only by its contamination of marine water bodies but also by its cascading effects on the entire biological chain, leading to significant environmental damage. These four types of pollution are pervasive, affecting most of the biosphere—from marine water bodies to soil—and ultimately entering the atmosphere through food chain consumption.[1]

The International Tribunal for the Law of the Sea has consistently emphasized, in several cases, the state responsibility of nations in managing marine pollution.[2] The urgency of this issue has also prompted major international organizations to accelerate their governance efforts. The United Nations, through the 2030 Agenda for Sustainable Development, has set a Sustainable Development Goal (SDG) to "prevent and significantly reduce all forms of marine pollution" (UN, 2015). Furthermore, the 2017 United Nations Ocean Conference issued the declaration "Our Ocean, Our Future: A Call to Action", urging nations to implement scientific and innovative measures to advance ocean conservation. The United Nations Environment Programme (UNEP) has repeatedly called for global action at environmental conferences (Aldred and White, 2022). In addition, international trade and investment organizations have become actively engaged in marine pollution governance. The United Nations Conference on Trade and Development (UNCTAD) has advocated for trade transformation to support the "blue economy".[3] The Trade and Environment Review Report (2023), released by UNCTAD, highlights the global ocean economy's estimated value of $3-6 trillion and warns that unchecked pollution and ecological degradation will weaken economic growth opportunities for developing nations and endanger the livelihoods of approximately three billion people who depend on the ocean. The United Nations Commission on International Trade Law (UNCITRAL) has also called for the elimination of institutional deficiencies in the current investment system that hinder environmental protection policies, including marine pollution management. It has advocated for the introduction of new clauses and mechanisms to promote the inclusion of environmental protection provisions in future international investment agreements (IIAs) and ensure that international investment law aligns with sustainable development goals, particularly in the governance of marine pollution (UNCTAD, 2022a).

These developments illustrate that the governance of marine pollution has expanded beyond traditional environmental boundaries. Various sectors, including trade and investment, have recognized its impact on economic development and sustainable markets, calling for urgent action. Countries have also acknowledged that the proliferation of marine pollution poses serious threats to their economic growth and living environments, leading them to implement necessary regulatory measures. In particular, there has been a growing emphasis on holding private entities, including multinational corporations, accountable for addressing marine pollution.[4]

Against this backdrop, this article seeks to address the following key question: What role can international investment rules play in tackling the escalating crisis of marine pollution and the urgent need for climate governance? To explore this issue, the article is structured as follows: Chapter 2 examines the deep interconnection between marine pollution and international investment flows; in Chapter 3, it analyzes how existing international investment rules can contribute to marine pollution governance; Chapter 4 discusses China's involvement in international investment rule changes and its role in marine pollution governance; and finally, the conclusion summarizes key findings and implications.

In tackling above question, the article will first employ a doctrinal research approach, systematically reviewing academic journals as well as international and national reports, in order to identify and analyze the existing intersections between marine

1 See The Ocean Conference, 'Factsheet: Marine pollution'. Available at https://sustainabledevelopment.un.org/content/documents/Ocean_Factsheet_Pollution.pdf#:~:text=of%20plastic,affected%20by%20marine%20debris%20ingestion (Accessed 8 March 2025).

2 For example, in the Deep-sea Mining Advisory Opinion Case (ITLOS Advisory Opinion on the Seabed Dispute 2011), the Tribunal clearly pointed out that the state acting as the guarantor of deep-sea mining has the obligation of "due diligence" to ensure that the enterprises it guarantees take necessary anti-pollution measures; in the case of Ireland v. United Kingdom (MOX Plant, 2001), the Tribunal issued interim measures requiring the two parties to cooperate in exchanging environmental information, reflecting the obligation of states to prevent pollution under the United Nations Convention on the Law of the Sea (UNCLOS); in the case of Malaysia v. Singapore (Land Reclamation, 2003), ITLOS ordered interim measures requiring Singapore to suspend part of the project and negotiate with Malaysia to take appropriate measures to avoid serious damage to the marine environment.

3 See UNCTAD, 5th UN Ocean Forum side event: From land to sea - Scaling innovations to tackle marine pollution. Available at https://unctad.org/meeting/5th-un-ocean-forum-side-event-land-sea-scaling-innovations-tackle-marine-pollution#:~:text=into%20a%20 (Accessed 8 March 2025).

4 China issued the China's Ocean Ecological and Environmental Protection '14th Five-Year Plan' in 2021, focusing on the reduction of total nitrogen and total phosphorus in river runoff into the sea, nearshore pollution control, and the prevention of "white pollution"; China has also signed cooperative documents with other countries (such as the 2018 China-Canada statement on marine litter from plastic pollution), jointly proposing to reduce single-use plastic products and strengthen supply chain cooperation to govern marine plastic. Japan implemented the "Plastic Resource Recycling Law" in 2022, imposing mandatory requirements on the recycling and utilization of industrial waste plastic. The European Union passed the "Directive on Single-Use Plastic (Directive 2019/904)" in 2019, banning the sale of certain plastic products (such as straws and cotton swabs), and also launched the revised "Waste Framework Directive," requiring member states to formulate integrated land and sea plastic waste reduction plans. The United States signed the "Save Our Oceans 2.0 Act" in 2020, further requiring government departments to expand international partnerships to jointly combat marine plastic and establish a marine debris fund.

pollution and investment law and to establish a baseline for further study. Then conduct legal textual analysis of primary instruments, including investment treaties, the United Nations Convention on the Law of the Sea, and pertinent case law, to demonstrate the significance of these intersections in marine pollution disputes. Finally, the article will conceptualize and classify "environmentally friendly" clauses within IIAs, using this categorization as an analytical paradigm to assess the scope and efficacy of treaty provisions in governing and mitigating marine pollution.

Based on the resolution of the aforementioned issue, the objectives of this article are threefold: First, to highlight a new pathway for marine-pollution control. By demonstrating the link between marine pollution and international investment flows, this article aims to draw the attention of policymakers, industry stakeholders, and environmental advocates to an alternative avenue for addressing coastal and offshore environmental harm. Second, to offer practical guidance to host States. By assessing the scope of regulatory authority under existing IIAs and categorizing and ranking their "environmentally friendly" provisions, this article provides concrete examples that coastal States (especially those with strong marine interests) can draw upon when negotiating or amending investment treaties to better safeguard their marine environments. Third, to mitigate ISDS and "regulatory chill" risks, this article identifies how host States can deploy investment law mechanisms to design marine environment regulations that both achieve environmental objectives and minimize the risk of investor State dispute settlement claims or regulatory deterrence. In sum, we hope this study will assist States in advancing marine pollution governance and catalyze further clean ocean initiatives worldwide.

2 The link between marine pollution and international investment flows

The World Economic Forum clearly pointed out in 2022 that sustainable ocean investments have already become a mainstream investment category. However, the acceleration of international investment flows can exacerbate or cause marine pollution. This chapter will demonstrate the negative impact of transnational investment flows on marine pollution through existing case studies. Regarding the selection of cases, this paper categorizes them into two types: firstly, direct investment in the marine environment itself (including the seabed), which directly contributes to marine pollution; and secondly, indirect marine pollution resulting from investments in coastal land-based industries.

In 2022, the World Economic Forum clearly indicated that sustainable ocean investments have already become a mainstream investment category (Janulis, 2022). However, the acceleration of international investment flows can exacerbate or cause marine pollution. This chapter will demonstrate the negative impact of transnational investment flows on marine pollution through existing case studies. For case selection, this paper divides them into two categories: firstly, direct investment in the marine environment itself (including the seabed), which directly contributes to marine pollution; and secondly, indirect marine pollution resulting from investments in coastal land-based industries.

2.1 Investment in the ocean leads directly to marine pollution

Investment in the ocean directly contributes to marine pollution, and there are several well-known cases of this. These cases can be divided into two types: the exploitation of deep-sea resources and aquatic biological breeding.

2.1.1 Pollution from direct marine investment: oil spills resulting from deep-sea resource exploitation

At present, pollution caused by the exploitation of deep-sea resources is primarily concentrated in large-scale seawater pollution resulting from oil spills. For example, in April 2010, the Deepwater Horizon semi-submersible drilling platform, operated by British energy company BP and its co-operating contractors,[5] exploded and sank in the Gulf of Mexico. It was the largest marine oil spill in history. The accident had a devastating impact on the Gulf of Mexico's ecosystem and the coastal economy. The U.S. government pursued strict liability and filed domestic lawsuits against BP and its contractors. The U.S. government promptly adopted the following legal measures: First, it raised the cap on oil-spill damages, overruling the $75 million limit set by Section 311 of the Oil Pollution Act of 1990 (33 U.S.C.§1321), thereby substantially strengthening financial penalties against the British investor from a claims-law standpoint. Second, it established the Gulf Coast Claims Facility (GCCF) as a dedicated trustee to process all spill-related claims. In constituting the GCCF's trusteeship, the government specifically included representatives from NOAA (the National Oceanic and Atmospheric Administration), the Departments of the Interior, Defense, Agriculture, and Energy, among others. In September 2014, Judge Carl Barbier of the U.S. District Court for the Eastern District of Louisiana found BP liable for "gross negligence" and "willful misconduct" under the Clean Water Act. Third, it broadened the range of potentially liable parties. Relying on the "polluter-pays" principle of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), the government imposed retroactive, strict, and joint and several liability. As a result, responsibility extends not only to the immediate polluter but may also reach prior project owners and even the parent company's officers and shareholders.

Aside from the U.S. government, other stakeholders sued BP for violations of the Federal Maritime Law, various state pollution

5 See U.S. Environmental Protection Agency, Deepwater Horizon - BP Gulf of America Oil Spill (6 February 2025). Available at https://www.epa.gov/enforcement/deepwater-horizon-bp-gulf-america-oil-spill (Accessed 8 March 2025).

control statutes, and numerous other federal and state laws. They sought broad common-law remedies including wrongful death, negligence, gross negligence, product liability, loss of business opportunities, breach of fiduciary duty, trespass, and nuisance. After a protracted legal battle, BP ultimately reached a settlement with the U.S. government, agreeing to pay more than $20 billion in fines, environmental remediation, and economic compensation. This included a record $5.5 billion fine under the Clean Water Act and up to $8.8 billion in natural resource damages. The incident also prompted the United States to tighten offshore drilling regulations, suspend deepwater drilling permits, and reform the Minerals Management Service regulatory system.

Additionally, in November 2011, an oil spill occurred at the Frade oil field off the coast of Rio de Janeiro, Brazil, at an appraisal well operated by the U.S. company Chevron Corporation. Oil leaked from the seabed and spread into a slick several dozen kilometers long on the surface. The Brazilian government responded decisively under the National Environmental Policy Act (Law No. 6.938/1981) and the Environmental Crimes Law (Law No. 9.605/1998). On November 21, the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA) imposed the maximum administrative fine of BRL 50 million (approximately USD 27.5 million) on Chevron. Federal prosecutors brought criminal charges against Chevron, Transocean, and 17 senior executives, but these charges were later withdrawn by mutual agreement. In October 2013, Federal Judge Pirro approved a Conduct Adjustment Term (TAC) under which Chevron agreed to invest BRL 300 million (about USD 135 million) in environmental restoration and social projects; the related civil lawsuit was dismissed, and Transocean was exonerated.[6]

Similar incidents have also occurred in China's territorial waters. In June 2011, two oil spills occurred at the Penglai 19-3 offshore oil field in China's Bohai Bay (jointly developed by U.S.-based ConocoPhillips and CNOOC).[7] With the intervention of the State Oceanic Administration of China and other authorities, ConocoPhillips was required to establish a fund to compensate affected aquaculture farmers and pay for ecological restoration. Following consultations between the Ministry of Agriculture, CNOOC, and ConocoPhillips, ConocoPhillips agreed to provide RMB 1 billion in compensation, of which RMB 731.5 million will be used to reimburse fishermen in the affected areas for aquaculture losses. Ultimately, ConocoPhillips and CNOOC jointly paid approximately 1.683 billion yuan in compensation to cover the losses of around 4,500 affected fishermen and to restore the ecosystem. (ConocoPhillips bore the primary responsibility for compensation, whereas CNOOC was not held liable as a non-operator.)

However, due to the initially low compensation standards set through administrative coordination, many aquaculture farmers were dissatisfied. Twenty-one farmers insisted on seeking compensation through litigation. Based on the available evidence and case facts, and with reference to the compensation standards established by the People's Government of Leting County, the Tianjin Maritime Court applying the Tort Liability Law of the People's Republic of China, ordered ConocoPhillips to pay CNY 1.68 million in damages to Luan and twenty other claimants.[8] Dissatisfied with the judgment, the twenty-one plaintiffs appealed. In its second-instance ruling, the Tianjin Higher People's Court dismissed the appeal and upheld the original decision. these farmers were only awarded an additional 1.68 million yuan in compensation—far less than their claimed actual losses. Notably, ConocoPhillips and CNOOC did not rely on formal litigation to initiate compensation but instead reached a settlement through administrative mediation. In this incident, the only dispute taken to court was between the aquaculturists whose stock was contaminated by the oil spill and ConocoPhillips over compensation for their losses.

2.1.2 Pollution from direct marine investment: chemical discharges from nearshore aquatic biological breeding

In addition to marine pollution caused by deep-sea mining, aquaculture investments in the coastal waters of host countries also directly contribute to marine pollution. In 2016, the Chiloé Archipelago in southern Chile experienced a massive harmful algal bloom ("red tide"), which killed approximately 23 million farmed salmon (Soberanes and Pérez, 2016). Residual feed and excreta in aquaculture cages are rich in nutrients such as nitrogen and phosphorus, which, combined with the abnormally high temperatures caused by El Niño, led to the excessive proliferation of algae. In Chile, the incident provoked a "legal storm", giving rise to four distinct types of litigation: First, the regional government where the harmful algal bloom occurred brought an environmental damage suit against two national agencies, the Directorate of Maritime Territory and Merchant Marine (Directemar) and the National Fisheries and Aquaculture Service (Sernapesca). The plaintiffs argued that these agencies had authorized the dumping of dead fish, but the case was dismissed for lack of clear causation between the dumping and the

6 J. Blount, Brazil judge dismisses case against Chevron, Transocean (1 October 2013). Available at https://www.reuters.com/article/business/environment/brazil-judge-dismisses-case-against-chevron-transocean-idUSBRE9900PS/#:~:text=The%20dismissal%20came%20after%20Judge,no%20responsibility%20for%20the%20spill. (Accessed 8 March 2025).

7 China Development Brief, ConocoPhillips damage claim case: first court hearing concluded (12 December 2014). Available at https://chinadevelopmentbrief.org/reports/conocophillips-damage-claim-case-first-court-hearing-finished/#:~:text=The%20Bohai%20Bay%20oil%20spill,their%20businesses%20suffered%20great%20losses (Accessed 8 March 2025).

8 China Judgements Online, Judgment on the Pollution-Damage Liability Dispute in Offshore and Open-Sea Waters. Between Luan Shuhai, Liu Mingwei, et al., and ConocoPhillips Petroleum China Co., Ltd. and China National Offshore Oil Corporation, (2012) (29 October 2015) (in Chinese). Available at https://wenshu.court.gov.cn/website/wenshu/181107ANFZ0BXSK4/index.html?docId=yV88v1QW8KERYclRaZN94GzDNxJcyBjMCpakAhzVsy9b3FVM9pb5pGI3IS1ZgB82vuY28G0CKUWwTjLRgFx3ykzjYnQ4kYfvlCjpus2RqfQlXE6Nc6N7iatvXMVlXGMq (Accessed 8 March 2025).

alleged harm.[9] Second, fishermen and diving organizations from the Chiloé Archipelago filed constitutional claims under Article 19(8) of the Chilean Constitution, asserting their right to live in a pollution-free environment.[10] The Supreme Court ultimately upheld the fishermen's claims. Affected fishermen lodged criminal charges (querellas) against the Director of Directemar. Morever, they also brought civil tort claims for damages against the Chilean Ministry of Finance. To date, the criminal and civil tort proceedings remain pending.

In Europe and North America, aquaculture is relatively well-regulated, yet there are still instances of conflicts between foreign investors and aquaculture regulations. In recent years, the province of British Columbia, Canada, has decided to phase out open-net salmon farms along the coast to protect wild Pacific salmon populations (Baker, 2023). Most of the aquaculture facilities in the region are controlled by foreign companies such as Mowi of Norway and Cermaq, a subsidiary of Mitsubishi UFJ Group. Due to long-standing concerns that open-net cage farming releases drugs into surrounding waters, the Canadian Department of Fisheries and Oceans has refused to renew licenses for 19 aquaculture facilities between 2020 and 2023, promoting a transition to closed containment facilities. This decision has sparked significant discontent among foreign investors. Companies such as Mowi and Cermaq have filed lawsuits, alleging administrative injustice and property damage. The Minister of Fisheries publicly stated that this action was "a prudent measure to protect endangered wild salmon." The affected Norwegian and Japanese investors have pursued legal action in Canadian courts, accusing the government of improperly exercising public power and engaging in de facto expropriation under international investment law. They are seeking substantial compensation. Thus far, the Canadian courts have upheld some of the aquaculture companies' claims in the first instance, ruling that the early decision-making process was unfair. However, after further consultations, the government reaffirmed its decision to shut down these farms, prompting companies to continue legal proceedings (Moore, 2025).

2.2 Investment in land leads indirectly to marine pollution

Indirect land-based investments that contribute to marine pollution occur frequently, primarily involving coastal investment and development activities that lead to a variety of environmental issues.

The Carmichael coal mine project in Queensland, Australia, financed and developed by India's Adani Group, has been one of the most controversial multinational mining projects in recent years. As the project progressed, several environmental issues emerged, including the illegal discharge of coal-laden wastewater during Tropical Cyclone Debbie, which polluted the adjacent Great Barrier Reef waters and wetlands (exceeding the permitted pollution levels by over 800%).[11] Furthermore, the operation of the coal mine will significantly increase the number of large coal ships passing through the Great Barrier Reef, heightening the risk of shipwrecks and oil spills. Additionally, the carbon emissions from coal combustion will further exacerbate coral bleaching due to climate change. Local Indigenous groups and environmental organizations have launched a series of protests and legal challenges against the project, forming the "Stop Adani" movement. For example, a local conservation organization successfully sued the federal minister for approving the project in breach of Sections 12, 24, and 136 of the Environment Protection and Biodiversity Conservation Act[12] they have also challenged state level approval processes as unlawful and brought climate-related lawsuits.[13] Several international banks have refused to finance the project due to mounting pressure (Hall, 2020). However, Adani's coal mine and port expansion continue to move forward with government backing.

As one of the world's leading nickel-rich nations, Indonesia has attracted substantial foreign direct investment in nickel mining and smelting in recent years. As a result, several large-scale nickel industrial parks have been established in Sulawesi and North Maluku through joint ventures between Chinese and foreign investors. However, intensive mining and smelting activities have severely polluted the local coastal environment. For example, on Obi Island in Halmahera, a large nickel mine and smelter, primarily controlled by Chinese capital, has led to significant environmental damage. The open-pit mining operations have resulted in the levels of heavy metals in the contaminated waters have risen significantly, which posed a risk to human health (Niarchos, 2023). Similar environmental degradation has been observed along the coast of mining regions in Sulawesi. Under mounting public pressure, the Indonesian government announced in 2021 that it would temporarily suspend approvals for deep-sea tailings disposal

9 Prensa, Tribunal rechazó demanda por vertimiento de salmones (2 January 2018). Available at https://www.maritimoportuario.cl/mp/tribunal-rechazo-demanda-por-vertimiento-de-salmones/#:~:text=El%20juzgado%20con%20competencia%20entre,en%20marzo%20del%20a%C3%B1o%20pasado (Accessed 8 March 2025).

10 Case number: N° 34.594-2017; P. M. Sariego, Jurisprudencia al día.Iberoamérica. Chile. Principio de prevención y precaución. Vertidos. Medio marino (25 July 2018). Available at https://www.actualidadjuridicaambiental.com/jurisprudencia-al-dia-iberoamerica-chile-principio-de-prevencion-y-precaucion-vertidos-medio-marino/#:~:text=Fuente%3A%20Sentencia%20de%20la%20Corte,2017 (Accessed 8 March 2025).

11 Australian Marine Conservation Society, It's the fight of our times - the fight to stop Adani's massive coal mine wrecking our vibrant Great Barrier Reef. Hundreds of thousands are standing between Adani and our Reef. Will you be one of them? Available at https://www.marineconservation.org.au/stop-adani-wrecking-our-reef/#:~:text=Reef%20www,the%20Port%20of%20Abbot (Accessed 8 March 2025).

12 Environmental Defenders Office, EDO is at the forefront of the legal battle over Adani' s Carmichael Coal Mine and other proposed mines in Queensland' s Galilee Basin. Available at https://www.edo.org.au/adani-and-the-galilee-basin/#:~:text=,was%20in%20fact%20required%20do (Accessed 8 March 2025).

13 Environmental Law Australia, Carmichael Coal (Adani) Mine cases in the Federal Court. Available at https://envlaw.com.au/carmichael-coal-mine-federal-court/#:~:text=Due%20to%20its%20enormous%20scale,Franklin%20campaign%20in%20the%201980s (Accessed 8 March 2025).

plans. However, serious environmental risks remain. The current system for tailings storage on land carries significant dangers—if a dam were to break or leak, toxic substances would still flow into the ocean. To date, the matter has not entered formal legal proceedings; however, if affected island residents were to sue, they could bring civil or administrative claims and, where corporate pollution is deemed criminal under Indonesia's environmental laws by the Ministry of Environment, they could even pursue criminal charges.

2.3 Summary of relevance

First, the abundant natural resources within the ocean have attracted a significant influx of investors, leading to the initiation of large-scale projects. Host countries often seek to leverage foreign investment to develop resources and stimulate economic growth (Iamsiraroj, 2016), and they actively approve such projects. However, potential environmental impacts are sometimes underestimated, or risks are overlooked due to economic performance pressures and profit-driven incentives. Second, in an effort to attract and retain investment, host countries may loosen environmental regulatory requirements or extend special political favors. Some foreign-funded companies take advantage of legal loopholes and weak enforcement in host countries to circumvent rigorous environmental impact assessments or minimize investments in safety and environmental protection (Beyza Satoğlu and Salmon, 2024). Third, once a project enters the construction and operational phases, a lack of effective monitoring and corporate self-regulation can result in highly polluting behavior. These pollutants directly enter the ocean, leading to water quality deterioration, habitat destruction, and biological loss. Multinational corporations, despite possessing advanced foreign technology and management expertise, are expected to uphold high environmental standards. However, in host countries, they may lower their operational standards to cut costs, leading to frequent pollution incidents. The occurrence of these emissions exacerbates the destruction of marine ecosystems, and the environmental damage caused by foreign corporations is often severe and irreversible. Once a disaster occurs, the costs associated with remediation, economic losses, and social consequences are immense. Additionally, environmental incidents frequently provoke widespread social protests, disrupt community livelihoods, and pose significant public health risks. These crises contribute to a decline in public trust toward foreign-funded enterprises, fueling local resistance. In response, governments are forced to allocate substantial financial resources for pollution cleanup, ecological restoration, and social compensation. Government intervention or public opposition may further escalate disputes between investors and host countries, potentially leading to investor-state dispute settlement (ISDS) cases (UNCTAD, 2022b).[14] This dynamic creates a vicious cycle, where efforts to promote economic growth and sustainable maritime development fail, instead turning maritime infrastructure projects into arenas of conflict between investors and host nations.

14 IISD, CIEL, ClientEarth, Investor-State Dispute Settlement (ISDS) Mechanisms and the Right to A Clean, Healthy, and Sustainable Environment (15 June 2023). Available at https://www.iisd.org/system/files/2023-06/iisd-ciel-clientearth-isds-sustainable-enivronment-submission-2023.pdf (Accessed 8 March 2025).

3 How can international investment rules become a powerful tool to address marine pollution?

The United Nations Convention on the Law of the Sea (UNCLOS), as the primary legal framework governing international maritime legal issues, does not explicitly prescribe the specific rules that foreign investors must follow when making direct or indirect investments in the waters of a host country. However, this does not preclude the necessary regulatory connections and interactions between UNCLOS and the investment agreements (IIAs) signed by host countries. The different sovereign and non-sovereign rights established in UNCLOS, ranging from the territorial sea to the high seas, enable the inflow of international investment (e.g., deep-sea mining, aquaculture, and ocean energy production). Before discussing how international investment rules can serve as a tool for managing marine pollution, the logical framework of this chapter must first be clarified:

Firstly, if IIAs, as the primary legal instruments governing international investment, are to contribute to marine pollution governance, their relationship with the law of the sea must focus on establishing the applicability of IIAs. Only when economic activities conducted in different maritime zones are recognized as "investments" and fall under the scope of IIAs can relevant pollution governance clauses be applied to curb the further spread of marine pollution. Secondly, existing IIAs contain several environmental governance provisions, collectively referred to in this chapter as "environmental clauses." These include environmental protection clauses, sustainable development clauses, corporate social responsibility (CSR) clauses, and human rights clauses related to environmental issues. Finally, if a host state implements regulatory measures under "environmentally friendly" provisions to curb investors' ongoing harm to the marine environment, such actions may negatively impact investors' interests. In such cases, investors may resort to international investment arbitration, particularly the Investor-State Dispute Settlement (ISDS) mechanism, to safeguard their rights and seek compensation from the host country. At this point, the host country may invoke the principle of "necessity" in international law or exception clauses in IIAs to justify the regulatory measures taken and avoid liability for compensation.

3.1 The possibility of applying the IIA to maritime investments

UNCLOS divides the ocean into two primary zones based on whether the coastal state possesses sovereign rights over a given area. Maritime zones under sovereign rights include: territorial waters (sovereignty extends to the water, seabed, airspace and subsoil); exclusive economic zones (sovereign rights to explore and exploit living and non-living resources, and the right to engage in economic development and exploration within the zone); and the continental shelves. Areas beyond sovereign rights are referred to in Chapter XI of UNCLOS as the "Area" encompassing the high seas and the international seabed. The legal status of investors is closely linked to the specific maritime zones in which they operate.

3.1.2 Investing in the waters of the host country where it has sovereign rights

Firstly, investment within the territorial sea, where the host country enjoys full sovereignty, constitutes an internal economic activity of that state. As such, these investments must comply with the investment contract signed between the host country and the investor. If an IIA (International Investment Agreement) exists between the investor's home country and the host country, then the investment must also adhere to the conditions stipulated within the IIA. Here, IIAs refers not only to bilateral investment treaties (BITs) but also to free trade agreements (FTAs) with investment chapters and investment-promotion agreements. It is important to emphasize the role of FTAs: beyond the specific investment chapter provisions on pollution control, many FTAs include overarching environmental clauses applicable to both investment and trade measures that help safeguard environmental governance throughout the agreement's scope. The WTO also contributes indirectly to marine pollution control in three ways. First, through its general exception clauses which balance environmental policy and trade and are often mirrored in IIA exception provisions. Second, by negotiating agreements relevant to marine stewardship, such as the WTO agreement on fisheries subsidies, which aims to curb marine ecosystem degradation. Third, via its dispute settlement mechanism's ability to dismantle "green trade barriers," as in the Tuna-Dolphin case, where environmental trade measures were upheld as non-discriminatory.

Secondly, investments in the Exclusive Economic Zone (EEZ) and the continental shelf, where the host country possesses sovereign rights but not full sovereignty, require a more detailed discussion. Although the EEZ and the continental shelf are defined separately, UNCLOS establishes their overlap within an area extending up to 200 nautical miles from the baseline of the territorial sea. Regarding the Exclusive Economic Zone (EEZ), Articles 56 and 58(2) of UNCLOS define a set of development rights and establish three key jurisdictions for coastal states within this area.; Regarding the continental shelf, Articles 77-81 of UNCLOS outline coastal states' rights over the exploration and exploitation of seabed resources, while Article 82 provides additional provisions for resource exploitation beyond 200 nautical miles. The sovereign rights established by these provisions serve as a crucial legal foundation for the application of IIAs to investments in these maritime zones.

The most direct legal basis for investment in the Exclusive Economic Zone (EEZ) and the continental shelf lies in the specific provisions of territorial clauses. For a long time, territorial clauses remained an underexplored area of research; however, recent studies have begun to address this gap (Liu and Duan, 2024). This is primarily because early international investments were largely confined to the land territory of the host country. Now that UNCLOS has extended sovereign rights to maritime areas, and these rights are closely linked to various economic activities, foreign investment has become an inevitable necessity for maritime development. Against this backdrop, the inclusion of territorial clauses in IIAs has played a crucial role in facilitating investment flows. However, certain ambiguities and inconsistencies remain regarding their application. A territorial clause generally refers to specific provisions within a Bilateral Investment Treaty (BIT) that define "territory," thereby clarifying the geographical scope of an IIA's applicability. The first IIA to explicitly extend sovereign rights to maritime areas was the 1981 Luxembourg-Bangladesh BIT, where Article 1.5 explicitly states that non-territorial waters include "areas beyond the geographical territory and territorial sea of the State … and any area or seabed over which the State has sovereignty under international law." Similarly, in the 1984 China-France BIT, Article 1.4 stipulates that "maritime areas refer to the marine and submarine areas over which the Parties exercise sovereignty in accordance with international law". In addition, FTAs often include comprehensive territorial provisions that apply to the entire agreement, including investment chapter, and are therefore of particular relevance. For example, the Gulf Cooperation Counci-Singapore Free Trade Agreement (GCC-Singapore FTA, or GSFTA), as a multilateral treaty, adopts a model geographic-scope clause in Article 1.3. That provision covers the entire sovereign territory land and adjacent maritime zones of each GCC member and of Singapore. Crucially, it does not enumerate the territories of Saudi Arabia, the UAE, or the other member states individually; rather, it employs the generic term "territory … of a Party," which uniformly applies to all signatories. This drafting choice treats each GCC member as a separate Party for the purposes of territorial application, even though the agreement was concluded by the GCC collectively with Singapore and thus obviates the need to define each member's territory in turn. Uniquely, the GSFTA does not reintroduce territorial clauses in subsequent chapters (on goods, services, government procurement, etc.), meaning that Article 1.3 governs the geographic scope throughout the entire text.

From the foregoing discussion, it is clear that the territorial provisions in both standalone BITs and more comprehensive FTAs underscore the fragmented nature of international law (Annacker, 2023). Based on the author's observations, territorial clauses can be categorized into two main types depending on whether their application is consistent for both contracting parties: the first type is where the application effects of the contracting parties are consistent. In this type, either the IIA explicitly includes non-territorial waters, such as the Exclusive Economic Zone (EEZ) and the contiguous zone, over which the coastal state has sovereignty or sovereign rights, within its scope of application;[15] or it only provides for "territorial sea and submarine areas",[16] excluding the contiguous zone, the continental shelf, and the EEZ. In this case, it remains unclear whether the IIA applies to maritime investment and development in areas outside the territorial sea. The second type is a territorial clause that has different application effects for the parties. This type refers to territorial clauses with two different scopes within the same agreement. For example, in the Rwanda-Singapore IIA, Article 1 of the territorial clause states that when applied to Rwanda, it refers only to its land territory, whereas when applied to Singapore, it explicitly includes any maritime zones over which Singapore may exercise sovereign rights and jurisdiction. A similar situation occurs in the Mexico-United Arab Emirates IIA.[17]

In summary, with an increasing number of territorial clauses incorporating maritime zones such as the contiguous zone, the continental shelf, and the EEZ within the geographical scope of IIAs, investment activities in these areas have also expanded significantly. These regions are now among the most active and concentrated areas for maritime investment and development. Particularly over the past 20 years, investments made by countries worldwide in their sovereign maritime areas have exhibited a trend of diversification. The scope of maritime development investment by multinational corporations primarily includes oil and gas development, fisheries and aquaculture, marine renewable energy (especially offshore wind), and the construction of port and shipping infrastructure. These investments have not only driven technological advancements and industrial scaling but have also contributed to the transformation of the global maritime economy in a greener and more sustainable direction.

At present, maritime investment takes various forms, including economic activities related to ships, submarine cables and pipelines, natural resources, and artificial installations. Among these common forms of maritime investment, some require special attention. Investments in natural resources and artificial installations are the most straightforward to classify as "investments" under IIAs, as they fall within the sovereign rights of the Exclusive Economic Zone (EEZ) and the continental shelf, as stipulated in Articles 56 and 77 of UNCLOS.[18] Therefore, if there is no sovereignty dispute over the EEZ and the continental shelf, the host country can exercise jurisdiction over investment activities in these areas and, in case of disputes, investors can resort to the ISDS mechanism to protect their investment interests. However, if a sovereignty dispute arises over the EEZ and the continental shelf (Gao and Jia, 2013), the question of which country's IIA should apply to investment disputes in these areas remains unresolved (Benatar and Schatz, 2020).

Identifying "investments" for the remaining three categories requires a more detailed legal assessment:

Economic activities carried out on board ships, such as oceanic sightseeing tours, marine refueling, and ship repair and salvage, take place on the surface of the EEZ of the host country, but are usually under the exclusive jurisdiction of the flag state. In terms of investment behavior, the flag state of these ships is often not the host country. In this case, if the host state's regulation of the ship's economic activities does not fall within the jurisdiction specified in Article 56 of UNCLOS, it is difficult for the IIA to serve as an international legal basis for the settlement of investment disputes, and the host state may struggle to justify its regulatory actions.

For example, in the historical development of international maritime rules, there have been many disputes regarding whether the host country has jurisdiction over certain matters relating to ships within its EEZ, such as the "SAIGA" case (1997), which involved disputes over offshore refueling of ships, the "Virginia G" case (2014) and the "San Padre Pio" case (2019),[19] as well as disputes over the detention of ships due to protests at sea, such as the "Arctic Sunrise" case (2015).[20] On the contrary, when foreign investors invest in the coastal territory of the host country and become shipowners, the flag state of the ships is the host country itself. Furthermore, if the IIA signed between the host country and the investor's home country recognizes immovable property as a form of investment, and such an investment passes the "Salini test" (Petsche, 2023), then the maritime economic activities of the vessel can be considered an "investment" and enjoy legal protection under the IIA.

In the area of submarine cables and pipelines, the key question is why these infrastructures hold economic significance to the host country. Specifically, if a cable or pipeline merely passes through the host country's EEZ, can it be considered an investment? Conversely, if the cable or pipeline directly serves the host country, how should it be understood? The former scenario involves mere "transit", which makes it difficult to identify as a legitimate "investment" under international law. The latter scenario is easier to establish, as long as it satisfies the "Salini test", in which case it should be considered a qualified investment (Petsche, 2023). However, in the practice of ISDS cases, there are also precedents questioning the geographical integrity of investments, which may also occur in disputes over submarine cables and pipelines. Specifically, should submarine cables and pipelines within the host country's territorial components be treated as separate from those located in the EEZ and continental shelf? This article argues that such an

15 Such as the Belgium-Luxembourg Economic Union-Bangladesh BIT, the United States-Argentina BIT, and the China-South Africa BIT.

16 Denmark-Sri Lanka BIT, Article 1(5), 1985.

17 Mexico-United Arab Emirates BIT, Article 1.10, 2016.

18 *Ibid.*

19 The M/V "SAIGA"(No. 2) Case, Saint Vincent and the Grenadines v. Guinea, Judgment of 1 July 1999, paras.137-138; The M/V "Virginia G" Case, Panama/Guinea v. Bissau, Judgment of 14 April 2014, para.255; See the M/T "San Padre Pio" Case (Switzerland v.Nigeria), Provisional Measures, Order, ITLOS Case No. 27, 6 July 2019.

20 The Arctic Sunrise Arbitration, Netherlands v. Russia, Award on the Merits of 14 August 2015, para.333.

understanding is inappropriate.[21] In cases such as SGS v. Philippines, SGS v. Pakistan, and Inmaris v. Ukraine, the tribunal has ruled that investment activities should not be rigidly confined to the host state's territorial boundaries but should instead be assessed holistically based on substantial connections between independent actions. In Inmaris v. Ukraine, the tribunal found that contracts relating to the main bareboat charter were an integral part of the investment, even though they could be performed independently. In SGS v. Philippines, the tribunal ruled that the investment made by a third-country subsidiary in the host country remained a single investment despite substantial activities occurring outside the host country (Switzerland), as the components were inseparable. Similarly, in SGS v. Pakistan,[22] the tribunal held that pre-shipment inspection activities conducted outside the host country could still be classified as part of the domestic investment, as they constituted an essential component of the investment in Pakistan.[23] Based on existing ISDS jurisprudence, submarine cables and pipelines, regardless of their geographical location, should be treated as complete and indivisible investments. Therefore, even if these infrastructures do not originate on the continental shelf or in the EEZ, the BIT can still be applied to them, and the host country retains jurisdiction over investment disputes.

3.1.3 Investment in areas where the host country has no sovereign rights

The most complex legal scenario arises with investments in areas where the host country has no sovereign rights. Such areas include the high seas and the international seabed, which UNCLOS refers to as "the Area." These are classified as "areas beyond national jurisdiction," where international law explicitly states that no State holds sovereignty or sovereign rights (Berry, 2021). Against this backdrop, a fundamental legal question emerges: how can a host State establish jurisdiction over "the Area" to facilitate the application of IIAs? State jurisdiction over vessels, persons, objects, or occurrences on the high seas is governed by other jurisdictional principles under international law and related connecting factors. In addition to obligations to prevent, prosecute, and cooperate in enforcing justice against certain unlawful acts, a State's primary jurisdictional responsibilities on the high seas include flag State jurisdiction, universal jurisdiction, protective jurisdiction, and personal jurisdiction.

First, according to Articles 92 and 94 of UNCLOS, ships on the high seas are under the exclusive jurisdiction of the flag State: "Ships fly the flag of only one State and, except in cases specifically provided for in international treaties or in this Convention, are subject on the high seas to the exclusive jurisdiction of that State." Furthermore, "Each State shall exercise effective administrative, technical, and social control over ships flying its flag." Additionally, States may exercise jurisdiction over specific international crimes or violations of international law that fall under universal jurisdiction, such as piracy, illegal broadcasting, human trafficking, and drug trafficking. In such cases, jurisdiction is not exclusive, and multiple States may exercise concurrent jurisdiction over the same matter. Moreover, coastal States may extend their jurisdiction to certain violations of their national laws occurring on the high seas to protect their national interests. This is primarily reflected in the "right of hot pursuit," which is a recognized principle under the high sea regime. Methods of enforcement include boarding, seizure, or arrest. Finally, personal jurisdiction is most evident in the construction of artificial islands and installations on the high seas, as well as the establishment of submarine cables and pipelines, which can serve as connecting points for the exercise of jurisdiction. However, the conditions for asserting jurisdiction can lead to instability in the host State's authority. For instance, if there is no violation of international law or no flag State vessels present on the high seas, the host State lacks the necessary jurisdictional links to exercise control. This limitation is widely recognized and remains an undisputed fact.

In cases where jurisdiction can be exercised, a relatively unique type of investment activity involves the development of resources within "the Area." As explicitly stipulated in Article 153 of UNCLOS, the exploration and development of "the Area" must be conducted in accordance with the rules, regulations, and procedures established by the International Seabed Authority (ISA). Article 153(2)(b) of UNCLOS specifically states that these activities must be undertaken "by the Contracting States or state enterprises, or by natural or legal persons of Contracting States, or by such States or their nationals effectively controlled … in cooperation with the Authority." Consequently, when resource exploration and development in "the Area" falls within the international investment framework, the traditional binary "investor-host State" structure is no longer applicable. Instead, a third party—the International Seabed Authority—is introduced into the regulatory framework. As a result, investors from Contracting States of UNCLOS who fail to obtain authorization from their home State cannot directly participate in deep-sea resource development under ISA regulations. This represents a significant barrier to investment access.

3.2 The positive role of "environmentally friendly" clauses in IIA

In Section 3.1, the potential application of IIAs to marine investments was explored. Building on this analysis, the following sections will examine which clauses within IIAs can be utilized to regulate pollution arising from marine investments. Notably, the most prevalent type of provision is the "environmentally friendly" clause, which is widely incorporated into IIAs. The term "environmentally friendly" is used to denote that, beyond clauses directly regulating environmental issues, IIAs also encompass provisions such as sustainable development clauses and corporate

21 Inmaris Perestroika Sailing Maritime Services GmbH and others v. Ukraine, ICSID Case No. ARB/08/8, Decision on Jurisdiction dated March 8, 2010, paras. 92-97.

22 SGS Société Générale de Surveillance S. A. v. Republic of the Philippines, ICSID Case No. ARB/02/6, Decision of the Tribunal on Objections to Jurisdiction dated January 29, 2004, paras. 101-112.

23 *Ibid.*, at paras. 136-139.

social responsibility (CSR) clauses. This term is distinguished from "environmental clauses," which have a more limited scope. Furthermore, provisions related to investment legality, exclusions, exemptions, and clarifications may also contribute to marine environmental protection. For example, an investment legality clause may require that investments comply with domestic environmental legislation.[24] Similarly, an exclusion clause may stipulate that certain types of investments are prohibited due to environmental protection concerns.[25] Additionally, an exemption clause may exempt certain environmental regulatory measures from being considered a violation of investor obligations.[26] A review of IIA development trends reveals that, at the beginning of the 21st century, only 35 IIAs contained the term "environment," accounting for 1.7% of all IIAs at the time. However, by 2024, this number had risen to 273, representing 8.0% of all IIAs (UNCTAD, 2024). The governance of marine environmental pollution is a crucial aspect of environmental protection, and the legality and international legal basis of governance measures can be derived from these clauses.

This section will analyze the IIA clauses that directly or indirectly relate to environmental protection, particularly marine environmental protection, to assess the positive effects of all "environmentally friendly" clauses in current IIAs. The analytical framework used in this study follows the recent work of Oliver Hailes (Hailes, 2024), who examines environmental issues in the context of international investment law. The categorization of environmental clauses in IIAs is based on their actual role in environmental governance and climate change mitigation. Hailes classifies these clauses into three categories. Deep Roots clauses, which promote environmental governance through general international legal mechanisms; Green Shoots clauses, which effectively enhance environmental protection; and Dead Wood clauses, which are largely ineffective in addressing environmental pollution. The analysis of these clauses is conducted through a secondary screening of three categories of provisions applicable at the stages of jurisdiction, normative interpretation, and exceptions for breaches. This article adopts this analytical paradigm, initially classifying "environmentally friendly" clauses based on their procedural application and then re-evaluating their potential effectiveness in marine pollution governance.

3.2.1 "Environmentally friendly clauses with jurisdictional exclusions in IIAs on environmental governance

The exclusion of jurisdiction is one of the most effective mechanisms for controlling environmental pollution, as it prevents host countries' environmental regulatory actions from being challenged through investment arbitration from the outset. This means that the host country does not need to worry about the occurrence of "regulatory chill". Moreover, it facilitates the implementation of enhanced regulatory measures.

Firstly, it is crucial to distinguish the most significant type of jurisdictional exclusion clause—the carve-out/exemption clause—from general exception or safety exception clauses, which will be addressed subsequently. The fundamental difference lies in the fact that the former completely excludes certain measures from the scope of arbitration between investors and states, [27]or further removes them from the scope of protection under the investment treaty (Henckels, 2020). When a contracting state invokes an exclusion clause to justify its actions, those actions are not considered fundamentally unlawful and remain legally valid. However, the measures in question fall outside the rights and obligations covered by the IIA. As many IIAs contain specific exceptions that apply only to particular provisions—such as indirect expropriation, environmental protection, tax policy, and public interest—these exceptions, together with general and safety exceptions, form a complex system of exclusions under the IIA. In this context, the carve-out/exemption clause does not serve to legitimize actions that may harm investors' interests; rather, it ensures that such actions are entirely beyond the jurisdiction of the arbitral tribunal. This mechanism provides a relatively seamless means for host countries to implement environmental governance measures.

Secondly, the clause on investment legality grants host countries the authority to regulate investments that violate domestic environmental laws. However, the investment legality clause alone does not independently exclude jurisdiction; rather, it must be combined with another provision in the IIA—namely, "any protected investment must be established in accordance with domestic law"[28] —to ensure that an arbitral tribunal lacks jurisdiction over investment disputes where the investor has failed to comply with domestic legal requirements. Furthermore, the investment legality clause allows host countries to file counterclaims in ISDS proceedings, particularly in cases such as Burlington and Perenco (Yamamoto et al., 2020). In these cases, Ecuador, as the respondent, filed counterclaims against the claimants (Burlington and Perenco), seeking to hold them strictly liable for environmental damage.[29] The arbitral tribunal ruled that environmental protection is a fundamental principle enshrined in Ecuador's constitution and, as such, falls within the scope of public interest, thereby affirming Ecuador's regulatory authority.[30] Conversely, in the Rusoro and Anglo-American cases, the arbitral tribunal explicitly stated that investors' violations of environmental protection obligations under the host country's domestic law could not, in and of themselves, constitute violations of obligations under

24 Morocco-Nigeria BIT, art 14 (2016).

25 Modernised ECT, annex NI, sections B and C (2022).

26 Kazakhstan-Singapore BIT art 11.1 (2018).

27 Mobil Exploration and Development Inc. Suc. Argentina and Mobil Argentina S.A. v. Argentine Republic, ICSID Case No. ARB/04/16, Decision on Jurisdiction and Liability, para. 1025, 10 April 2013; CC Devas v India, PCA Case No. 2013-09, Award on Jurisdiction and Merits, para. 293, 25 July 2016.

28 For example, the Morocco-Nigeria Bilateral Investment Treaty, Article 1 and Article 3.

29 Burlington Resources Inc. v. Republic of Ecuador, ICSID Case No. ARB/08/5, Decision on Ecuador's Counterclaims (7 February 2017), para. 262.

30 *Ibid*, at para. 233.

the IIA. As a result, the tribunal did not uphold the host country's counterclaims.[31]

In Oliver Hailes' research, the jurisdictional-stage refusal of benefits and exclusion clauses was also discussed. However, such clauses are exceedingly rare in practice. Consequently, this article will not delve further into their discussion. With regard to refusal of benefits clauses, Part II of the IIA explicitly states that "causing serious environmental damage on the territory of the host country" is a prerequisite for denying IIA benefits to enterprise investors.[32] Furthermore, given the current absence of an effective IIA incorporating such provisions, no existing cases have excluded an investment from protection due to environmental violations.

3.2.2 Provisions that explain what "environmentally friendly" means and how it should be used in IIA environmental governance

Oliver Hailes' categorization of clauses that address conflicts with international multilateral environmental agreements, introductory clauses that establish the regulatory rights of environmental supervision, scope interpretive clauses, effective implementation clauses, and non-regression legal clauses under the breach category is outlined in his research. However, this article argues that this categorization tends to focus more on articulating or further clarifying the host country's environmental regulatory measures rather than on breaches of obligations.

Firstly, when an IIA conflicts with certain multilateral environmental agreements, what mechanisms can be implemented to more effectively resolve this quasi-normative conflict, which stems from the fragmented nature of international law (Zhu, 2024)? To illustrate, consider the Paris Agreement, which mandates that parties, through nationally determined contributions (NDCs), take action to reduce greenhouse gas emissions to achieve its objectives and enhance resilience to rising temperatures. When a host country implements measures to reduce emissions, such actions may directly affect investors' property interests, potentially leading to investor dissatisfaction (UNCTAD, 2022b). The host country may argue that such measures are necessary to align domestic regulations with the emission reduction obligations outlined in the Paris Agreement. However, investors may contend that, given that NDCs allow for independent decision-making in climate change mitigation plans with fewer restrictions on foreign investment, the host country's measures are disproportionate and overly strict. The former can be interpreted as an externalization of a normative conflict between treaties, while the latter reflects the investors' perspective that such a normative conflict is not recognized. Article 104 of NAFTA provides a paradigmatic example of a conflict clause, granting multilateral environmental agreements "priority" (i.e., they shall prevail), provided that the measures stipulated in such agreements are "least in conflict with other provisions of NAFTA" and that "equally effective and reasonable means to fulfill such multilateral environmental obligations" exist. Notably, most conflict clauses in IIAs adopted after NAFTA follow a similar structure to Article 104 (Atanasova, 2021).

Secondly, environmental regulatory authority is often referenced in the preambles of numerous IIAs. The significance of including such references in preambles lies in their role in guiding arbitral tribunals to interpret treaty provisions in a way that aligns with broader environmental protection objectives, thereby clarifying many "constructive ambiguities" in the application of substantive clauses. For instance, the preamble of the 2019 BIT between Myanmar and Singapore explicitly reaffirms the Parties' right to implement and adopt new measures—including health, safety, and environmental measures related to investments in their territories—to achieve legitimate public policy objectives.

Thirdly, mandatory enforcement and non-waiver clauses also contribute to improved environmental governance. "Enforcement" in this context refers to the requirement that IIA Parties effectively fulfill their environmental and climate governance obligations under multilateral agreements, such as the NDC commitments under the Paris Agreement. Non-waiver clauses ensure that states cannot attract foreign investment by weakening domestic environmental laws.[33] However, in specific ISDS cases, if an IIA does not explicitly include non-waiver clauses within the scope of agreed arbitration,[34] the arbitral tribunal may determine that it lacks jurisdiction over the clause.

3.2.3 The "environmentally friendly" provisions are seen as "affirmative defences" in the IIA's environmental governance

The term "affirmative defense" is a general term encompassing common exception clauses and national security exception clauses, which are prevalent in current IIAs. The reason it is referred to as an affirmative defense is that its invocation is premised on the assumption that the host country's regulatory measures have already been found to violate the obligations stipulated in the IIA. This differs from the carve-out clause discussed earlier. A carve-out clause excludes the host country's regulatory actions from the arbitral tribunal's jurisdiction from the outset, meaning there is no legal determination on whether the host country's actions violate the IIA. Conversely, the applicability of an affirmative defense clause presupposes that the host country's regulatory measures have undergone review under the IIA and have been deemed to violate its obligations. The host country then invokes the clause to avoid paying compensation to investors (Kurtz, 2016).

General exception clauses originate from Article 20 of the GATT 1994. To maximize their applicability, many IIA Parties have modified these clauses when incorporating them into their treaties, particularly in relation to environmental protection. This often involves integrating the specific content of Article 20 of the GATT 1994 with environmental protection provisions. For example, Article 9.8 of the China-Australia FTA (2015) and Article 33 of the China-Canada BIT explicitly include

31 Rusoro Mining Ltd. v. Bolivarian Republic of Venezuela, ICSID Case No. ARB(AF)/12/15, Award (22 August 2016), para. 628; Anglo-American plc v. Bolivarian Republic of Venezuela, ICSID Case No. ARB(AF)/14/1, Award (18 January 2019), paras. 529-530.

32 Colombia Model BIT (2017), Article [##] - Denial of Benefits.

33 Such as NAFTA Article 1114(2).

34 Al Tamimi v Sultanate of Oman, ICSID Case No ARB/11/33, Award (3 November 2015).

"environmental measures related to the protection of exhaustible biological or non-biological natural resources" within their definitions of environmental protection. This demonstrates how Article 20 of the GATT 1994 has been adapted to address contemporary environmental challenges.

The national security exception clause has long been enshrined in Article 21 of the GATT 1994. However, its precise scope and application remained ambiguous. Until the emergence of WTO disputes such as *US-Origin Marking (Hong Kong, China), Russia-Traffic in Transit, and US-Steel and Aluminum Products (Turkey)*, the content and scope of the national-security exception under Article 21 remained largely undefined. In these cases, panels offered several key interpretive guidelines: first, the phrase "it considers" in Article 21(1)(b) is not absolute, meaning that panels must review a respondent's invocation rather than defer entirely to its own assessment; second, "essential security interests" cannot be construed so broadly by a member that the exception becomes a generalized escape clause, thereby ruin the integrity of international economic law; and third, panels imposed strict limits on both the temporal application of the exception and the definition of "other emergencies."[35] In short, the panels concluded that Article 21 must be interpreted and applied under rigorous constraints to prevent it from undermining the international trading system.[36] Nonetheless, ISDS tribunals appear to have applied the national security exception more frequently and earlier than the WTO. For example, numerous ISDS cases involving national security exceptions emerged in response to Argentina's economic crisis. However, different arbitral tribunals have rendered varying interpretations of the national security exception clause, leading to differing views on: who has the authority to make security determinations, how to assess the severity of an emergency situation, whether to apply the principle of proportionality.[37] Additionally, it remains unclear whether environmental concerns qualify as national security matters under ISDS jurisprudence. At present, there is no existing precedent that explicitly establishes environmental issues as falling within the scope of national security exceptions.

3.3 How pollution generated in the course of marine investments can be addressed through "environmentally friendly" provisions

In Section 3.2, this chapter categorized and filtered out the "environmentally friendly" clauses discussed, prioritizing those with the most effective role in controlling marine pollution.

Firstly, it is important to note that although traditional BITs rarely make direct references to "the ocean," modern IIAs increasingly incorporate provisions addressing marine environmental protection, climate change, and the sustainable use of resources through dedicated environmental chapters. For instance, the environmental chapter of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) mandates that contracting parties maintain a high level of environmental protection and effectively enforce environmental laws. Furthermore, it requires countries to engage in cooperative efforts to address significant environmental challenges, including the protection of marine species, biodiversity, and the transition to a low-emission economy. Article 20.16 of the CPTPP further prohibits certain fisheries subsidies to prevent overfishing and protect marine fishery resources. Similarly, the environmental chapter of the US-Mexico-Canada Agreement (USMCA) contains explicit obligations related to marine debris, prevention of marine pollution, protection of marine life, and fisheries management. It requires contracting parties to combat illegal, unreported, and unregulated (IUU) fishing and to control the impact of land-based pollution on the ocean. While these provisions do not fall under the investment chapter, they form an integral part of the overarching agreement framework, reflecting a shared commitment to marine environmental governance—which, in turn, influences the regulatory environment for marine-related investment projects. Furthermore, many agreements in the renewable energy sector provide incentives for investments in clean energy, often articulated through cooperation clauses or preambles. For instance, numerous recent agreements among G20 nations advocate for renewable energy investment as a means of attracting sustainable investment. Additionally, some agreements explicitly reference global climate objectives. For example, recent EU investment agreement proposals emphasize that all parties should strive to achieve the objectives outlined in the Paris Agreement. This, in effect, incentivizes financial flows into green technologies and low-carbon projects.[38] These specialized clauses reflect a broader shift in international investment rules, aligning investment governance frameworks with environmental priorities, including marine protection and climate action.

Secondly, with regard to the numerous clauses referenced in Section 3.2, this article systematically organizes and categorizes them. The underlying rationales for this categorization are analyzed through three distinct lenses: firstly, the priority of regulatory intensity, wherein clauses with the potential to directly enhance the host country's environmental regulatory authority are assigned higher rankings; secondly, the level of governance, where the earlier a regulation is implemented in the sequence of "prevention, control, and treatment" of pollution, the higher its ranking; and thirdly, enforceability, which considers the applicability of clauses in

35 WTO ANALYTICAL INDEX, GATT 1994 - Article XXI (DS reports), p. 4-11. https://www.wto.org/english/res_e/publications_e/ai17_e/gatt1994_art21_jur.pdf (Accessed 8 March 2025).

36 Report of the Panel, WT/DS512/Report.

37 CMS Gas Transmission Co. v. The Republic of Argentina, ICSID Case No. ARB/01/8, Award of May 12, 2005; Enron Corp. Ponderosa Assets v. The Republic of Argentina, ICSID Case No. ARB/01/3, Award of May 22, 2007; Sempra Energy International v. The Argentine Republic, ICSID Case No. ARB/02/16, Award of September 28, 2007.

38 UNCTAD, Sustainable Development Takes on Heightened Significance in Investment Treaties (28 October 2024). Available at https://unctad.org/news/sustainable-development-takes-heightened-significance-investment-treaties#:~:text=Recent%20international%20investment%20agreements%20,G20 (Accessed 8 March 2025).

international investment arbitration and their legal certainty. The stronger the applicability and certainty, the higher the ranking.

The initial level comprises the carve-out clause; the subsequent level incorporates general exception clauses and regulatory power clauses; the third level consists of non-waivable clauses, conflict clauses, investment legality clauses, and exclusion clauses; the fourth level includes enforcement clauses and denial of benefits clauses; and the final level is the national security exception clause. The underlying rationales for this structuring are as follows:

The "carve-out" clause is assigned a high ranking in regulatory priority because, if the host country's environmental protection measures are designated as "carve-out," investors are precluded from claiming compensation for these measures under the investment agreement. This directly strengthens the host country's regulatory authority over environmental protection, allowing it to prevent and control marine pollution without triggering a "regulatory chill." From a governance perspective, such clauses are primarily employed to prevent disputes, effectively excluding marine environmental pollution control measures from the scope of the agreement during IIA negotiations and drafting. In the absence of this carve-out, the host country's environmental measures may be subject to investor claims, as evidenced by challenges to government decisions banning offshore oil drilling under the Energy Charter Treaty. However, with an environmental carve-out, such challenges can be effectively preempted.[39] Regarding enforceability, it is generally accepted that, provided the clause is clearly worded, arbitral tribunals will uphold its "exclusion" function.

In the following discussion, attention will be given to general exception clauses and regulatory power clauses, which fall in the second tier. While both provisions empower the host country to implement essential measures for marine pollution control, their effectiveness depends on the arbitral tribunal's interpretation. These provisions are used to justify environmental protection measures that have already been implemented, with tribunals assessing whether such measures are legitimate and whether they adhere to principles of necessity and proportionality. For example, restrictive measures imposed by a host country to prevent and control marine pollution (e.g., limiting overfishing, prohibiting the discharge of harmful substances into the sea) can be recognized as exceptions permitted by the agreement, provided they meet conditions such as necessity and non-discrimination. Similarly, general, non-discriminatory environmental protection regulations (e.g., controlling marine pollution, establishing marine protected areas) should not be considered as violations of investor rights. This is exemplified by the Philip Morris v. Uruguay case, where Uruguay implemented strict regulations on tobacco packaging and marketing due to public health concerns. The arbitral tribunal cited the preamble of the IIA and general principles of international law in its ruling, affirming Uruguay's sovereign right "to legislate and regulate in the public interest" and granting the state broad discretion in implementing public health measures.[40] Compared to general exception clauses, regulatory power clauses often lack explicit enforcement standards. As a result, arbitral tribunals must infer their function from the treaty's obligations. If such clauses are only included in preambles or general statements, tribunals may prioritize substantive obligations under the agreement over regulatory power, treating the latter as a secondary consideration.

In this context, it is clear that both IIAs and related contracts adopt "necessity" as a key threshold in assessing measures. The concept of necessity has been interpreted in various ways when invoked to justify the inclusion or enforcement of environmental-protection clauses in international investment agreements (IIAs) and contracts. When discussing necessity, practitioners often invoke Article 25 of the Draft Articles on State Responsibility—an established principle of international law, which permits states to take otherwise unlawful measures to safeguard essential interests, such as environmental protection, when no other means are available.

Nonetheless, the application of necessity in ISDS disputes remains contested. This is most evident in the series of cases against Argentina: the tribunals in *CMS*, *Enron*, and *Sempra* accepted Argentina's necessity defense in light of its economic crisis,[41] while the tribunals in *LG&E* and *Continental Casualty* rejected it.[42] Today, ISDS practice broadly recognizes three core conditions for necessity: (1) protection of a "vital interest" of the state; (2) a "grave and imminent peril"; and (3) absence of any reasonable alternative measure. Yet tribunals differ considerably in how they apply these tests. Some maintain a strict standard to preserve treaty stability; others adopt a more flexible approach or resort to treaty interpretation techniques that afford host states regulatory leeway. Where measures are taken for environmental or public-health purposes, tribunals have shown greater tolerance, underscoring the ongoing tension and uneasy balance between the discipline of investment law and the imperatives of international public policy.

The third level of analysis concerns non-waivable clauses, conflict clauses, investment legality clauses, and exclusion clauses. These clauses are infrequently encountered in practice. Non-waivable clauses and investment legality clauses primarily focus

39 L Schaugg, S H Nikièma, N Bernasconi-Osterwalder, Investor-State Dispute Settlement and Fossil Fuels: What role for a carve-out? (8 March 2024). Available at https://www.iisd.org/itn/2024/04/02/investor-state-dispute-settlement-and-fossil-fuels-what-role-for-a-carveout/#:~:text=The%20ECT%20%2C%20an%20energy,month%2C%20the%20United%20Kingdom%20also (Accessed 8 February 2025).

40 Philip Morris v. Australia, PCA Case No. 2012-12, Award on Jurisdiction and Admissibility, December 17, 2015.

41 CMS Gas Transmission Co. v. The Republic of Argentina, ICSID Case No. ARB/01/8, Award of 12 May 2005; Enron Corp. Ponderosa Assets v. The Republic of Argentina, ICSID Case No. ARB/01/3, Award of 22 May 2007; Sempra Energy International v. The Argentine Republic, ICSID Case No. ARB/02/16, Award of 28 September 2007.

42 LG&E Energy Corp. et al. v. The Republic of Argentina, ICSID Case No. ARB/02/1, Decision on Liability, 3 October 2006, para. 238; Continental Casualty Company v. The Argentine Republic, ICSID Case No. ARB/03/9, Award of 5 September 2008, para. 180.

on domestic law compliance; conflict clauses are rarely invoked; and while exclusion clauses can be highly effective (e.g., preventing polluting investments from being protected under the IIA), their effectiveness depends on clearly defined scope. If the wording is ambiguous, investors may argue that the measures involved do not fall within the exclusion clause.

The fourth level includes enforcement clauses and denial of benefits clauses, which have a limited impact on marine environmental pollution governance. Notably, enforcement clauses often lack direct arbitration mechanisms. For example, the host country cannot initiate legal action against an investor under the investment agreement for violations of environmental laws unless the agreement explicitly permits counterclaims. However, enforcement clauses enable the host country to cite them in arbitration to justify its policies, demonstrating that its actions align with the agreement's objectives. From an arbitration perspective, such clauses have contributed to the increased recognition of environmental issues. Nevertheless, investment arbitration remains primarily focused on investor rights, making the direct impact of these clauses weaker compared to general exception or regulatory power clauses. Instead, enforcement clauses function more as "background rules" that encourage states to consider environmental issues (including marine pollution governance) within the framework of investment agreements. In contrast, the denial of benefits clause indirectly promotes environmental protection, though its impact is limited. It may help exclude speculative investors who lack genuine environmental commitments, but it does not ensure proactive environmental action. Its primary function is to reinforce the integrity of the agreement itself rather than to influence environmental regulations. However, given the complexity of multinational corporate structures, the denial of benefits clause remains a useful tool for host countries to protect their policy space, including environmental policies. At the very least, it ensures that only legitimate foreign investors can challenge host country regulations under the agreement, reducing speculative claims that could undermine environmental protections.

The national security clause is positioned at the final tier because it allows contracting states to take measures to safeguard national security without being constrained by investment agreements. However, this clause is generally invoked in cases of war, armed conflict, or emergencies—scenarios not inherently associated with environmental concerns. In the context of marine environmental pollution control, the national security clause exerts minimal influence. Pollution prevention and control generally fall under routine regulatory oversight rather than national security measures. Although discussions on "environmental security" have emerged in recent years (e.g., climate change as a security threat), environmental measures in investment agreements are typically addressed through environmental exceptions or regulatory powers, not national security clauses. Unless pollution escalates into a direct national security crisis, the national security clause has little relevance to marine pollution control. It serves primarily as a "last resort" mechanism in extreme situations, offering minimal direct support for routine environmental policies. The primary function of the national security exception in investment agreements is to safeguard state sovereignty, allowing states to act without incurring compensation obligations under the agreement when facing existential threats. Consequently, it occupies a lower echelon in the hierarchy of legal instruments—not due to insufficient legal strength, but because its practical relevance to environmental oversight is minimal. In marine environmental governance, priority should be given to environmental-specific clauses, with the national security exception serving only as an emergency fallback.

4 China's ideas and plans for using the IIA rule in the fight against marine pollution

As global trade and investment expand, concerns about the environmental impact of foreign investments, particularly on marine ecosystems, have intensified. China, as the world's largest recipient of foreign investment and one of the most active outbound investors, plays a crucial role in shaping international investment governance and marine environmental protection. In this final section, this article examines recent developments in China's legal and policy framework concerning these issues. This includes an analysis of China's domestic laws and regulations, key international agreements, China's current governance approach, as well as challenges and potential solutions.

4.1 A summary of domestic and international legal rules that China can apply in the field of marine pollution control

4.1.1 China's legal provisions for the governance of marine pollution

China has strengthened its marine pollution control framework through continuous legal improvements. The most significant legislation in this regard is the Marine Environmental Protection Law of the People's Republic of China, which applies to all activities conducted within China's territorial waters. Since its enactment in 1982, this law has undergone multiple revisions, with significant amendments introduced over the past two decades. For example, in 2017, the law was updated to clarify corporate responsibilities in marine pollution prevention and to impose stricter penalties for non-compliance. The most recent revision in 2023, which takes effect in 2024, introduces substantial reforms aimed at integrating land and sea governance, enhancing ecosystem protection, and increasing public participation. Additionally, the penalties for polluters have been significantly increased. For instance, the new law stipulates that individuals or entities responsible for destroying coral reefs or other marine ecosystems may face fines ranging from 1,000 to 10,000 yuan per square meter. Furthermore, authorities are now empowered to seize vessels and revoke operational licenses of violators. These amendments address previous shortcomings related to low penalties and weak enforcement, thereby serving as a stronger deterrent against marine pollution.

In addition to the Marine Environmental Protection Law, the revised Environmental Protection Law has further strengthened China's capacity to prevent and control marine pollution. Dubbed "the strictest environmental law in history," the revised law was passed in 2014 and came into effect in 2015. One of its most significant changes was the removal of the upper limit on fines for environmental violations. It introduced a system of daily accumulating fines, ensuring that the cost of non-compliance exceeds the cost of adhering to regulations. Moreover, corporate executives can now be held personally liable, and local governments that fail to enforce environmental laws are subject to accountability measures. Additionally, the revised law grants specific social organizations the right to file public interest lawsuits, reinforcing legal oversight and compliance. These measures have significantly increased the risks associated with environmental violations, including marine pollution, prompting businesses to adopt stricter pollution prevention and control measures.

The aforementioned laws also apply to foreign enterprises operating in China. According to Article 2 of the Marine Environmental Protection Law, any individual or organization engaging in activities that may affect marine environments within Chinese jurisdiction must comply with the law. This means that foreign companies must adhere to China's marine environmental protection standards, including emissions limits and mandatory environmental impact assessments for construction projects. Furthermore, the Foreign Investment Law, which came into effect in 2019, explicitly mandates that foreign enterprises comply with China's laws and regulations, including environmental protection obligations. Failure to do so may result in severe penalties, including production suspension and mandatory corrective actions. In summary, China has significantly strengthened its legal framework for marine environmental protection in recent years, providing a more robust legal basis and improved enforcement mechanisms to combat marine pollution. All enterprises, including foreign-invested ones, must adhere to these legal requirements to ensure environmental sustainability.

4.1.2 The legal provisions related to marine pollution control at the international law level involving China

Environmental clauses in international investment agreements are becoming an important tool for controlling marine pollution. Historically, China's bilateral investment treaties (BITs) rarely mentioned environmental protection, but significant improvements have been made over the past decade. Some recent BITs now incorporate explicit commitments to environmental protection. For example, the China-Canada BIT (signed in 2012) states in its preamble that investment should be based on the principles of sustainable development and includes interpretative clauses clarifying that environmental and health-related measures do not constitute indirect expropriation. Article 33 of the treaty further provides that specific actions undertaken by host countries or investors to protect the environment or promote public welfare shall not be deemed treaty violations. Similarly, the China-Tanzania BIT (2013) encourages investors to "fulfil corporate social responsibility" in its preamble, highlighting the growing importance of environmental and social responsibility. Although these clauses are largely aspirational, they indicate a broader shift toward more environmentally friendly provisions in China's BITs.

In terms of free trade agreements (FTAs), China has also promoted environmental and marine protection through multilateral and bilateral agreements. The Regional Comprehensive Economic Partnership Agreement (RCEP) does not contain an independent environmental chapter due to the diverse environmental policies among its member states. As a result, RCEP's marine environmental protection commitments primarily focus on cooperation rather than enforceable obligations. However, another significant Asia-Pacific agreement, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), sets forth ambitious environmental objectives. CPTPP member states pledge to uphold environmental protections, enforce their domestic environmental laws, and refrain from lowering environmental standards to attract trade or investment. The agreement also requires parties to take measures to prevent ship-based pollution, in alignment with the International Convention for the Prevention of Pollution from Ships. Additionally, it mandates action against illegal fishing and promotes the conservation of marine biodiversity. Although China is not currently a CPTPP member, it has expressed concerns regarding the agreement's environmental provisions. Should China seek membership in high-standard agreements like the CPTPP in the future, it would need to strengthen its domestic marine environmental protection framework to meet compliance requirements while also leveraging the agreement's mechanisms to promote stronger marine environmental governance among all parties.

The increasing integration of environmental considerations into investment rules has two key implications for addressing marine pollution. First, investment agreements incorporating environmental safeguards empower countries like China to adopt robust marine protection measures without excessive concerns about treaty violations. For example, clauses that prevent countries from lowering environmental standards to attract investment help deter competitive deregulation and promote environmental integrity. Second, international agreements foster cross-border environmental cooperation. For instance, under the China-Chile Free Trade Agreement, a memorandum of understanding on environmental cooperation was signed to enhance bilateral marine conservation efforts. Conversely, the absence of environmental safeguards in agreements—such as in RCEP—may create a gap between investment protection and environmental protection, potentially allowing investment activities to negatively impact marine ecosystems. Thus, maximizing and refining environmental provisions in international investment agreements is essential for preventing and mitigating marine pollution while ensuring that both investment and environmental objectives can be successfully achieved.

4.2 China's current situation in governing ocean pollution through international investment rules

In China, the government has been making continuous efforts to improve its legal framework and strengthen environmental protection. In 2018, significant institutional reforms were introduced. Previously, the Ministry of Environmental Protection and the State Oceanic Administration shared responsibility for environmental governance. However, these functions have now been consolidated under the newly established Ministry of Ecological Environment, which includes a dedicated Marine Ecological Environment Department. This restructuring has created new mechanisms for integrating land and sea governance, enhancing efforts to curb both terrestrial and marine pollution, and improving oversight of water quality before it enters the ocean.

Following these reforms, the Ministry of Ecological Environment launched a nationwide initiative to identify and regulate pollutant discharge points into the sea. A comprehensive list of such points was compiled, accompanied by a real-time monitoring system to control land-based pollution sources that flow into marine environments. At the local level, coastal provinces have implemented the "Bay Chief System" (similar to the "River Chief System"), whereby designated officials at various levels are responsible for overseeing bay water quality and ecological management, thereby reinforcing local governance responsibilities.

For foreign investment projects, China strictly enforces the environmental impact assessment (EIA) and the "Three Simultaneities" system. This requires that all coastal development projects and newly established foreign-funded enterprises undergo an EIA in advance, with a primary focus on their impact on marine ecology and pollution prevention measures. Without EIA approval, construction and operations cannot proceed, and post-completion, environmental protection facilities must pass regulatory inspections before formal operations can commence. China has also intensified environmental compliance inspections targeting multinational corporations. In recent years, several foreign enterprises operating in China have been investigated and fined for environmental violations, such as illegal emissions and exceeding pollution limits. These penalties are now applied equally to both domestic and foreign enterprises.

Since 2015, the Ministry of Ecological Environment has launched special environmental enforcement campaigns, such as "Sword of Justice," including foreign-funded enterprises in its inspection scope. With the implementation of the revised Environmental Protection Law in 2015, authorities at all levels have strengthened law enforcement, adopting a zero-tolerance approach toward illegal pollution. According to official statistics, in the first year following the new environmental law's enactment, more than 200 companies were ordered to halt production for rectification, and over 100 corporate executives were detained for environmental violations. These stringent enforcement measures also apply to coastal and marine-related projects, significantly curbing pollution from industrial activities and port operations. Additionally, coastal provinces have designated ecologically sensitive areas, such as bays and mangroves, as strict control zones to mitigate the environmental impact of both foreign and domestic projects. The Environmental Protection Law has also introduced heavier penalties, including daily accumulating fines, asset seizures, and administrative detention, to deter corporate pollution. As a result, many foreign companies have increased their environmental investments in China to mitigate legal risks. Overall, China has established a robust marine environmental protection system, integrating project approval, pollution discharge permits, real-time online monitoring, on-site inspections, public reporting mechanisms, and legal accountability measures.

A notable case highlighting China's approach to governing marine pollution within the context of international investment is the Bohai oil spill incident involving ConocoPhillips. In 2011, the Bohai Penglai 19-3 oilfield—a joint venture between ConocoPhillips (United States) and CNOOC (China)—suffered multiple oil leaks, contaminating approximately 6,200 square kilometers of marine waters, an area roughly equivalent to six Singaporean islands. The spill resulted in severe economic losses for the fishing and coastal tourism industries. In response, Chinese regulatory authorities ordered an immediate suspension of all production activities and initiated a comprehensive investigation. ConocoPhillips, as the operator, was held primarily responsible for the incident. Subsequently, the government facilitated a compensation agreement between ConocoPhillips and CNOOC, finalized in 2012, which allocated 1.683 billion yuan to establish a fund for compensating affected fishermen and restoring the marine ecosystem. Approximately 4,500 fishermen accepted the compensation plan. However, as the initial plan did not cover losses incurred by the tourism industry, additional lawsuits were filed by tourism operators and some fishermen. In 2015, the Tianjin Maritime Court ruled that ConocoPhillips was liable for compensating 21 aquaculture households a total of 1.68 million yuan.

This case also marked China's first marine environmental public interest litigation, in which an environmental advocacy organization filed a lawsuit against ConocoPhillips and CNOOC in the Qingdao Maritime Court, demanding accountability for ecological damage to the Bohai Sea. These legal proceedings reflect the Chinese government's multi-faceted approach to handling marine pollution incidents involving foreign investment, including administrative penalties, negotiated compensation settlements, and judicial relief. The ConocoPhillips spill also exposed weaknesses in China's marine environmental protection framework at the time, such as unclear legal provisions regarding ecological compensation, challenges in evidence collection for affected parties, and lengthy litigation procedures.

China's efforts in marine pollution governance, particularly in cases involving foreign investment, have gained international recognition. Firstly, multinational enterprises operating in China have developed a deeper understanding of the country's stringent environmental enforcement, and the global investment community now recognizes that compliance with China's environmental regulations is essential to avoid severe consequences. This has led to improved environmental practices among multinational corporations and has also encouraged their home countries to strengthen oversight of their overseas operations. Additionally, China's approach serves as a model for developing countries seeking to balance environmental protection with foreign investment. China has successfully avoided the "race to the bottom" scenario, where countries weaken environmental protections to attract investment. By preserving environmental policy space within investment agreements and rigorously enforcing domestic environmental laws, China has demonstrated that economic growth and environmental sustainability are not mutually exclusive. Moreover, China's approach also challenges past investment arbitration trends, which often suggested that developing countries compromise on environmental policies to attract foreign investment. Instead, China has ensured that foreign investments themselves transition towards greener and more sustainable practices.

This shift in policy has drawn attention from international organizations and research institutions. Recent studies indicate that over 8% of international investment agreements now incorporate environmental clauses, with China's practices playing a significant role in this trend. Initiatives such as the "Green Belt and Road," China's ratification of the Paris Agreement, and the implementation of the WTO's "Fisheries Subsidies Agreement" have further reinforced China's position as a responsible global environmental actor, contributing positively to international marine governance. However, the international community has called for China to accelerate the phase-out of outdated coastal industries and strengthen regulatory oversight of high-seas and offshore fishing activities. These external pressures, coupled with China's internal policy objectives, continue to drive the evolution of its environmental policies, both domestically and internationally.

4.3 China's shortcomings in governing marine pollution through international investment rules

4.3.1 The challenge of aligning laws and agreements

A significant number of China's early investment agreements lack explicit environmental exceptions or liability clauses, which may constrain the government's ability to enforce environmental regulations. If foreign investors perceive that newly introduced marine environmental protection measures infringe on their investment interests, they may initiate arbitration claims under the provisions of older BITs. Such risks are not merely hypothetical; there have been numerous international cases where governments were sued over environmental policies, including disputes related to mining bans, refusal to issue landfill permits, and prohibitions on the production of hazardous chemicals. Although China has not yet faced arbitration losses due to investor challenges against environmental regulations, this potential risk should not be overlooked. The absence of environmental clauses in investment agreements creates significant difficulties in defining legal responsibilities and resolving disputes related to marine environmental governance.

4.3.2 The potential impact of disputes between investors and the host country

In international arbitration, the intersection between environmental protection and investor rights has become a critical issue. For China, such conflicts may arise in two primary ways. Firstly, foreign investors may argue that strict enforcement of marine environmental regulations constitutes "indirect expropriation" or "unfair treatment," thereby exposing the Chinese government to potential international claims. Secondly, Chinese investors engaged in overseas projects may seek arbitration against host states if their projects are restricted by the host country's environmental policies.

Existing cases illustrate the varying approaches arbitration tribunals take toward environmental regulations. For example, in Eco Oro v. Colombia, the tribunal had to determine whether Colombia's legislation banning mining in highland areas constituted expropriation. The ruling upheld the legality of Colombia's environmental prohibition, setting an important precedent affirming the regulatory powers of host states. However, other cases have resulted in rulings favorable to investors, requiring host countries to pay substantial compensation. These cases highlight the need for the Chinese government and enterprises to integrate environmental considerations into investment agreements and project planning, ensuring proactive risk management to avoid adverse legal and financial consequences.

4.3.3 Coordination of investment facilitation and environmental protection

China's participation in multilateral investment mechanisms has not been fully leveraged for environmental governance. While the Regional Comprehensive Economic Partnership (RCEP) promotes regional investment facilitation, it lacks binding environmental protection obligations. Some critics argue that RCEP missed the opportunity to use trade agreements as a tool to enhance environmental governance. One challenge for local governments is ensuring that environmental standards are upheld while attracting foreign investment.

In some coastal regions, economic incentives have led to excessive land reclamation and the establishment of heavy industries near shorelines, resulting in ecological red line violations. This demonstrates the urgent need for stronger accountability mechanisms to safeguard marine ecosystems, particularly amid the global surge in investment activity. Although national-level initiatives, such as marine inspections, have been implemented to compel local governments to address these issues, achieving a sustainable balance between long-term environmental governance and economic development remains a pressing challenge.

4.4 Measures that China can take to address its shortcomings

To address these existing shortcomings, China can adopt the following measures:

Firstly, optimizing the environmental provisions in investment agreements. In future BIT and FTA negotiations, China should insist on incorporating environmental and sustainable development clauses. For example, the general exceptions clause and the indirect expropriation annex of the China-Canada BIT could serve as a model. Explicit language should be included in agreements stating that "environmental protection measures do not constitute a treaty violation." For existing agreements that lack such clauses, China should supplement them through protocols, memorandums, or other legal instruments to ensure that legitimate government actions to protect marine environments do not trigger state liability.

Secondly, introducing investor environmental obligations. Investment agreements should explicitly require investors to comply with the environmental laws of the host country. Additionally, a non-exemption clause should be included, stipulating that investors who violate environmental regulations cannot seek investment arbitration relief. Encouragingly, some recent agreements already contain provisions in their preambles that encourage enterprises to fulfill social responsibilities. Going forward, these provisions should be strengthened to become binding obligations, ensuring that foreign investments meet environmental standards at every stage of their operational life cycle.

Thirdly, strengthening environmental dispute prevention and resolution mechanisms. China should enhance its domestic compensation and dispute resolution frameworks for marine environmental damage, thereby reducing the motivation of affected parties to resort to international arbitration. The promotion of environmental public interest litigation and ecological compensation systems is essential to ensure that all polluters, whether domestic or foreign, are held financially accountable for marine pollution. Providing robust domestic remedies not only ensures legal justice but also mitigates the risk of international disputes escalating.

Fourthly, actively participating in international environmental governance. China should leverage multilateral platforms to advocate for the integration of marine environmental protection into investment regulations. For example, China's "Build Blue Partnership" initiative, introduced at the 2017 United Nations Ocean Conference, is a promising step in this direction. Future strategies could involve aligning this initiative with the Belt and Road Initiative to promote regional agreements or action plans for marine environmental protection, ensuring synergy between investment and environmental governance. Furthermore, China should support the development of stricter international conventions under organizations such as the International Maritime Organization (IMO) and the United Nations Environment Programme (UNEP). These conventions should be incorporated into domestic regulatory frameworks to establish fair and transparent green investment standards for foreign investors.

Fifthly, strengthening environmental guidance for outbound Chinese investment. China should continue improving its environmental protection guidelines for overseas investments and advocate for initiatives such as the "Green Silk Road." By doing so, it can reduce host country concerns and prevent disputes arising from environmental violations by Chinese enterprises abroad. Additionally, future bilateral investment agreements should include cooperation clauses that enable host countries to directly engage with China on major environmental concerns. Such clauses should emphasize diplomatic and mediation-based dispute resolution mechanisms, reducing the reliance on arbitration and fostering constructive environmental cooperation.

5 Conclusion

In summary, international investment law plays a significant and distinctive role in the governance of marine pollution, with its function as a legal instrument becoming increasingly prominent. On the one hand, transnational investment activities are closely linked to marine environmental pollution: foreign direct investment, while often driving industrial development and resource exploitation, has also become a major contributor to marine pollution, necessitating the integration of investment rules into marine environmental governance. Conversely, international investment agreements (IIAs) provide a regulatory framework for foreign investors by incorporating environmental protection clauses. A growing number of contemporary investment agreements explicitly stipulate that investment liberalization and the exercise of investor rights must not come at the expense of environmental protection. This study demonstrates that integrating international investment rules with marine environmental law can transform IIAs into an effective legal tool for combating pollution and safeguarding marine ecosystems, thereby providing a robust institutional foundation for sustainable marine development.

However, for investment law to govern marine pollution smoothly and effectively, several existing obstacles must be dismantled:

First, there remain stark divergences between Global North and Global South over technology, financing, and the allocation of responsibilities. Developed and developing countries have different expectations regarding financial contributions and technology transfers in marine pollution control. This North-South divide hampers the practical implementation of the "common but differentiated responsibilities"(CBDR) principle and undermines coordinated action on pollution prevention. Moreover, cross-border cooperation in green technology development, clean production upgrades, and marine pollution monitoring faces significant barriers. These real-world challenges show that achieving comprehensive global governance of the marine environment will require overcoming the long-standing North South imbalance.

Second, specific obstacles persist in sharing advanced environmental technologies for green innovation, clean production retrofits, and pollution monitoring. Intellectual property restrictions, funding shortfalls, and a lack of trust based international mechanisms prevent effective global diffusion of these technologies, weakening developing countries' ability to tackle marine plastic and chemical pollution.

Such realities underscore that bridging the North-South development gap is a long-term prerequisite for effective global marine environmental governance.

Looking ahead, it is imperative for China and the international community to further strengthen environmental clauses in the formulation and revision of investment agreements to enhance global governance cooperation. For China, there is a need to expand and reinforce the environmental provisions in bilateral investment agreements. Notably, it is only in the past decade that China's investment agreements have begun to incorporate more environmental-related clauses, and there remains significant room for improvement in both scope and enforceability. Drawing on successful precedents, such as the China-Canada BIT (2012), which includes four distinct environmental clauses, China could consider systematically embedding environmental and sustainable development clauses in the preamble, protection standards, exceptions, and other provisions. This approach would ensure that China's investment activities—both domestically and internationally—align more closely with the principles of ecological civilization and contribute to the broader transformation of investment rules towards a more environmentally sustainable framework.

At the international level, stronger cooperation among nations is required to promote the standardization and reinforcement of environmental clauses in investment agreements through multilateral platforms. In future, coordinated multilateral action will prove effective. As UNCTAD has observed, harmonized reforms at the multilateral level create legal certainty and benefit a wide range of stakeholders. For example, embedding clear investment-policy framework provisions in the proposed International Convention on Marine Plastic Pollution could offer a concrete pathway: each Party would be required to ensure its investment policies align with marine pollution-prevention objectives and to obligate foreign investors to meet the Convention's marine-environment protection standards. This would integrate investment activities into the broader governance of the marine environment and help bridge the gap between investment rules and environmental obligations, avoiding a siloed approach between investment and environmental agreements. Moreover, UNCTAD could spearhead the drafting of a model annex on marine-environment clauses for international investment agreements. This annex could serve as a template for States negotiating bilateral or multilateral treaties, guiding them in including explicit marine-ecology protection obligations. Model language might clarify that bona fide regulatory measures taken to fulfil marine-protection duties do not amount to indirect expropriation and would reaffirm the host State's sovereign right to safeguard its marine environment. Such provisions would help States strike a balance between investment protection and environmental stewardship in future treaty negotiations while reducing the chilling effect of ISDS on domestic environmental policies. By converting these high-level cooperative initiatives into binding legal instruments, the international community can systematically resolve the tension between investor rights and marine-environment governance, ultimately achieving more effective remediation of marine pollution. The integration of global environmental objectives—including, but not limited to, commitments under climate agreements and the United Nations Sustainable Development Goal of "reducing marine pollution" into the text of investment agreements will enable a deeper convergence between international investment law and environmental governance. This, in turn, will strengthen the legal framework and resilience of the international investment system while encouraging countries to address transboundary environmental challenges, such as marine pollution, in a cooperative manner, thereby contributing to the long-term goal of global sustainable development.

However, the unresolved systemic tensions continue to heighten conflicts between international investment and environmental governance, including marine pollution. In particular, the clash between investor-state dispute settlement (ISDS) mechanisms and national environmental sovereignty remains stark. Many IIAs lack robust environmental safeguards. When coastal States adopt stringent environmental regulations or restrict polluting investments to fulfill their marine conservation duties, foreign investors may invoke and ultimately trigger expensive ISDS claims. This risk creates a pronounced "regulatory chill," causing some countries to hesitate before enacting or enforcing marine protection policies for fear of arbitration. Thus, under the current international investment law framework, the conflict between investor rights and State environmental obligations persists, and further research is needed to both secure investors' legitimate interests and preserve States'space to fulfill their marine governance responsibilities.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material. Further inquiries can be directed to the corresponding authors.

Author contributions

XL: Conceptualization, Writing – review & editing, Writing – original draft, Funding acquisition. ZY: Methodology, Investigation, Writing – review & editing, Writing – original draft.

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