

Social and Environmental Responsibility of Maritime Activities in Colombia and China from a Comparative Law Perspective*

Responsabilidad social y ambiental de las actividades marítimas de Colombia y China a partir del derecho comparado

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Abstract:

This research aims to analyze the social and environmental responsibility of maritime activities in Colombia and China through a comparative law approach to environmental management policies. The study identified key aspects of liability for environmental damage in the legislation of both countries and the measures taken to repair damages and sanction offenders. Utilizing a qualitative, descriptive, and documentary design, significant differences were revealed in their legal and regulatory approaches. Colombia adopts a more reactive stance focused on damage repair and penalties, while China emphasizes preventive measures and stricter regulation. Successful cases are noted in both nations but with contrasting approaches. These findings highlight the necessity for robust and proactive environmental legislation to mitigate the negative impacts of maritime activities, as well as the importance of international collaboration and the exchange of best practices to address these global challenges.

Keywords: Environmental Legislation, Marine Ecosystems, Management Policies, Water Conservation, Environmental Protection.

Resumen:

Esta investigación tiene como objetivo analizar la responsabilidad social y ambiental de las actividades marítimas en Colombia y China, utilizando un enfoque de derecho comparado sobre las políticas de gestión ambiental. Se identificaron los principales aspectos relacionados con la responsabilidad por daños ambientales en la legislación de ambos países, así como las medidas adoptadas para reparar daños y sancionar a los responsables. A través de un diseño cualitativo, descriptivo y documental, se revelaron diferencias significativas en los enfoques legales y regulatorios. Colombia adopta un enfoque más reactivo, centrado en la reparación de daños y sanciones, mientras que China prioriza medidas preventivas y una regulación más estricta. Aunque se destacan casos exitosos en ambas naciones, sus enfoques son contrastantes. Estos hallazgos enfatizan la necesidad de contar con una legislación ambiental robusta y proactiva, para mitigar los impactos negativos de las actividades marítimas, así como la importancia de la colaboración internacional y el intercambio de mejores prácticas para enfrentar estos desafíos globales.

Palabras clave: legislación ambiental, ecosistemas marinos, políticas de gestión, conservación del agua, protección del medioambiente.

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Introduction

Maritime activity is undoubtedly an important source of economic and social development for countries with extensive coastlines and their respective exclusive economic zones.¹⁻² However, maritime activities can cause significant damage to the environment if not properly managed; in this sense, maritime activities such as shipping, and fishing can generate a large amount of garbage and waste that pollute the oceans and threaten marine life.³⁻⁴

For this reason, liability for environmental damage in maritime activities is a highly relevant issue that must be approached in a rigorous and multidisciplinary manner, involving the participation of experts in various areas, such as environmental management and law. Therefore, environmental legislation and corporate social responsibility become a fundamental tool for the resolution of environmental problems worldwide. In this sense, it is important to have clear and effective regulations to protect the environment, and it is there where environmental legislation should be seen as a preventive instrument, which seeks to avoid damage to the environment and promote responsible practices by companies and society in general; likewise, these regulations must be constantly updated to adapt to the new challenges that arise in this area.⁵

Similarly, Corporate Social Responsibility can be defined as those situations in which a company commits itself and performs actions that benefit social welfare, beyond its own interests and what is expected as compliance with laws.⁶ According to this definition, what really identifies the implementation of social responsibility in a company is a behavior that goes beyond compliance with laws, that is, a behavior that transcends in its actions.

Following this reasoning, a series of treaties, conventions, protocols and/or agreements related to liability for environmental damage in maritime activities have been developed at the international level, which have been adopted and ratified by various countries throughout the world. An example of this is the 1969 International Convention on Liability for Oil Pollution Damage adopted by countries such as Spain, Colombia or Ecuador, which establishes that shipowners are liable for damage caused by oil pollution, and must take measures to prevent pollution and to respond promptly in case of accidents; in addition, this convention also calls for the creation of an international fund to compensate the victims of pollution, financed by a mandatory contribution from the owners of ships that transport large quantities of oil.⁷

The 1981 Convention for the Protection of the Marine Environment and the Coastal Zone of the Southeast Pacific, ratified by Colombia through Law 45 of 1985,⁸ adopts measures to prevent and control marine pollution, including oil pollution, pollution by chemical substances and pollution by waste; it also establishes measures to protect marine and coastal biodiversity, including the protection of endangered species and the conservation of natural habitats.

Considering the above, in countries such as China, marine environmental pollution is an increasingly serious problem, so they have found in judicial processes an important tool to address the solution to this problem, since they have evidenced the application of the criterion of punitive damages for violations of the ecological environment as an effective measure to deter offenders and promote environmental protection in public interest litigation.⁹ Similarly, it is important to mention that China approaches the system of compensatory funds for oil pollution damage caused by ships from the perspective of marine environmental

governance, with the aim of improving the protection of the marine environment and ensuring adequate compensation to the victims of such damage.¹⁰

In addition, it is important to note that China's environmental civil liability has a combined civil and administrative liability approach to address environmental pollution, and also establishes the concept of the separate regulation paradigm, which involves the creation of independent regulatory agencies to address specific environmental problems.¹¹

Now, with respect to the Colombian context, we start from the assumptions addressed by articles 79 and 90 of the Political Constitution of 1991, where the importance of protecting the environment and natural resources in Colombia is reflected; these articles establish the right of all persons to enjoy a healthy environment and the responsibility of the State to guarantee the protection of the environment.¹² Regarding the latter, it is important to mention that in order to establish civil liability for environmental damage, elements such as the need to prove the existence of damage, negligent conduct, a causal relationship between the conduct and the damage, and the quantification of the damage must be determined.¹³

Finally, according to Colombian jurisprudence and doctrine, environmental damage is a source of liability and is legally defined as: "any affectation, diminution or impairment of the value of natural and environmental resources that leads to the violation of collective environmental rights and interests. This damage can be caused by illegal activities as well as by legally permitted activities, but which imply an abuse or disregard of environmental rights."¹⁴

In view of the foregoing, it is clear that, under Colombian law, there are two types of measures to address environmental damage. First, the State has the duty to plan the management and use of natural resources to guarantee their sustainable development, their conservation, restoration or substitution, and to prevent and control the factors of environmental deterioration, and, secondly, individuals are also responsible for environmental damage and inadequate use of environmental resources.

This leads the Colombian State to impose legal sanctions and demand the reparation of the environmental damages caused, and to respond for the environmental damages caused in the exercise of its activities. This is reflected in Law 1333 of 2009, which establishes the Colombian legal framework for the prevention and control of environmental pollution in the country. The purpose of this law is to protect the environment and human health, establishing preventive and corrective measures to avoid pollution and sanctioning individuals and companies that violate environmental regulations, which may include fines, temporary or permanent closure of facilities, and in some cases, even imprisonment.¹⁵

However, despite the above, and understanding that although there is legislation for the protection of natural resources in both countries that tends towards sanctions, there is still evidence of damage to marine ecosystems. One possible explanation for this situation is that, although there are laws and regulations that seek to protect natural resources and the environment, these laws are not always effectively applied or enforced. In addition, in some cases, the penalties for violating these laws may not be strong enough to deter companies and individuals from further damaging marine ecosystems. There may also be a lack of environmental awareness and education among the population, which can lead to irresponsible and harmful behavior towards the environment. Therefore, the objective of this research was to answer the following question: What is the social and environmental responsibility of maritime activities in Colombia and China from the perspective of environmental management policies based on comparative law?

Main Aspects Related to Liability for Environmental Damage in the Environmental Legislation of Colombia and China

Colombia and China share a commitment to the protection of the marine environment and coastal zones through the approval and/or ratification of international treaties and agreements. Colombia has acceded to a number of conventions, such as the International Convention on Liability for Oil Pollution Damage, the International Convention for the Prevention of Pollution from Ships, and the United Nations Convention on the Law of the Sea, which establish responsibilities and regulations to prevent marine pollution and protect coastal areas.¹⁶

China is a signatory to the United Nations Convention on the Law of the Sea and the Convention on Biological Diversity, which commits it to follow standards for the sustainable management of the oceans and the conservation of marine biodiversity, as well as the International Convention on Civil Liability for Oil Pollution and Oil Damage.¹⁷ Both countries are focused on protecting the marine and coastal environment, complying with international standards and promoting regional cooperation. These efforts reflect their recognition of the importance of maintaining healthy marine and coastal ecosystems, which play a fundamental role in national and global environmental and economic sustainability.

In Colombia, Articles 79 and 88 of the 1991 Political Constitution of the Republic of Colombia recognize the environment as a right, allowing citizens to seek its protection through popular action; additionally, Articles 8, 80 and 95 establish the obligation of the State to conserve natural wealth and plan for its sustainable management, thus imposing a duty on individuals to protect natural resources and the environment.¹⁸ Accordingly, Sentence T-092/93 issued by the Constitutional Court states that the right to the environment is linked to the right to life and health of persons, which is why it has qualified the environment as a constitutionally protected legal right.¹⁹

In China, the environment is not explicitly recognized as a fundamental right, but the 1982 Constitution of the People's Republic of China establishes the State's responsibility for environmental protection and pollution prevention. However, it does not contain provisions on constitutional actions for environmental protection nor does it define specific duties for citizens in its articles.²⁰

Therefore, it can be said that while Colombia includes specific provisions in its Constitution that guarantee the right to the environment, actions for its protection and duties for both the State and individuals, China addresses these issues mainly through its environmental legislation and policies, without expressly including them in its Constitution. Both countries share a commitment to environmental protection but do so differently from a constitutional perspective.

Environmental legislation in Colombia is articulated through several key norms that establish a robust framework for the protection of natural resources and environmental management. Decree Law 2811 of 1974 is fundamental, as it introduces the National Code of Renewable Natural Resources and Environmental Protection, recognizing the environment as a common heritage and promoting the participation of both the State and citizens in its conservation.²¹ This decree prohibits the excessive use of natural resources that may cause environmental deterioration and establishes standards for zoning and proper waste management. Subsequently, Law 99 of 1993 creates the Ministry of the Environment and establishes the National Environmental System (SINA, for its Spanish acronym), which modernizes the provisions on environmental management and regulating protected areas, while Decree 1076 of 2015 compiles and updates existing regulations, simplifying administrative procedures to promote sustainable development.²²

Complementing this legal framework, Law 1333 of 2009 (mentioned above) establishes a sanctioning regime for environmental infractions, ensuring compliance through effective sanctions and clear procedures. In addition, the Colombian Penal Code criminalizes environmental offenses, providing a more severe

approach to serious violations against nature.²³ Together, these regulations reflect a comprehensive commitment to environmental protection in Colombia, establishing a solid foundation for sustainable development and the conservation of natural resources, as well as promoting social and criminal liability for actions that threaten the environment.

Environmental legislation in China has evolved through several key regulations that seek to protect natural resources and promote sustainable development. The 1979 Water Resources Protection Regulation was one of the first significant efforts, establishing guidelines for the conservation and sustainable use of the country's water resources. This regulation laid the groundwork for the regulation of water use and the protection of aquatic ecosystems, emphasizing the importance of balancing economic development with environmental conservation.²⁴ Thereafter, the Environmental Protection Law of 1989 expanded this approach by establishing a more comprehensive legal framework for environmental protection in general, promoting environmental responsibility at both the state and individual levels, and encouraging public participation in environmental decision-making.²⁵

Additionally, the Marine Environment Protection Law, in force since 1982 and revised in 2016, focuses on the preservation and sustainable use of marine resources. This law establishes specific measures to prevent marine pollution and properly manage coastal ecosystems, reflecting a commitment on the part of the Chinese government to address environmental challenges in its territorial waters.²⁶ Taken together, these regulations demonstrate an effort by China to create a regulatory framework that not only protects the environment, but also promotes economic development that is sustainable over the long term, recognizing the interdependence between economic growth and environmental health.

In Colombia, the environmental authorities play a crucial role in the management and protection of the environment and are organized into various entities operating at different levels. The Ministry of Environment and Sustainable Development is the country's highest environmental authority, responsible for formulating and coordinating environmental policies at the national level. Under its direction, the National Environmental Licensing Authority is responsible for granting environmental licenses for projects that may have a significant impact on the environment, ensuring that sustainability and natural resource protection standards are met. In addition, the Regional Autonomous Corporations are public entities that operate at the regional level, managing natural resources and promoting sustainable development in their respective jurisdictions, with administrative and financial autonomy. These authorities work together to ensure a comprehensive approach to environmental protection, promoting citizen participation and compliance with current environmental regulations.²⁷

In China, environmental authorities are organized into several entities that play crucial roles in environmental protection and natural resource management.²⁸ The Environmental Protection Leading Group, under the State Council, coordinates environmental policies at the national level and oversees the implementation of strategies to address problems such as pollution and resource conservation. At the local level, environmental protection agencies are responsible for enforcing environmental regulations in their respective jurisdictions, ensuring compliance with regulations set by the central government. Such a structure allows for management that is closer to local realities, facilitating the adaptation of policies to the specific needs of each region.

In addition, the intermediate-level People's Court and the Maritime Court play important roles in the implementation and enforcement of environmental laws. The People's Court is responsible for resolving environment-related disputes and ensuring that environmental rights are respected, while the Maritime Court focuses on issues specific to the marine environment, addressing pollution and marine resource protection cases.²⁹ Together, these institutions reflect a comprehensive approach to environmental governance in China, seeking to balance economic development with sustainability and environmental protection.

Measures adopted by the Authorities in Colombia and China to Repair the Damage and Punish those Responsible for Environmental Damage caused by Maritime Activities

In Colombia, environmental protection is supported by a legal framework that includes both criminal and administrative sanctions. The characteristics of each of these types of sanctions are detailed below. The Colombian Penal Code develops several crimes related to the environment, including illegal exploitation of renewable natural resources, wildlife trafficking, illegal fishing, damage to natural resources, ecocide and environmental contamination, whose penalties may include prison sentences ranging from 5 to 11 years, in addition to significant fines.³⁰ These provisions seek to discourage behavior that damages the natural environment and promote greater environmental responsibility among citizens and companies.

The administrative area is mainly regulated by Law 1333 of 2009 mentioned above, which determines the environmental sanctioning procedure. This procedure consists of several stages: (i) The preliminary inquiry where the existence of facts that may constitute environmental violations is verified, (ii) the initiation of environmental investigation where the process is formalized after the inquiry, (iii) the formulation of charges where specific charges are filed against the alleged offender, (iv) the evidentiary period where evidence related to the case is collected and analyzed, (v) the determination of environmental liability where the authority evaluates whether there is guilt, and (vi) the imposition of the sanction, where the offender has the opportunity to file an appeal for reconsideration against the resolution declaring liability.³¹

Administrative penalties can be severe, with fines that previously reached up to 5,000 minimum legal monthly wages (SMLMV, for its Spanish acronym) but have been increased to up to 100,000 SMLMV after recent reforms. This reflects according to the Constitutional Court in Sentence SU-455/2020 a more rigorous approach to environmental infractions, seeking not only to punish but also to prevent future damage to the environment, since the sanctioning procedure is governed by constitutional and legal principles that ensure due process, allowing violators to defend themselves adequately at each stage of the process, which is crucial to ensure justice and fairness in the application of sanctions.³²

In China, the legal framework related to environmental protection includes both criminal penalties and civil provisions. On the criminal side, the Criminal Law of the People's Republic of China³³ in Articles 338 and 340 addresses the offenses of (i) dumping of hazardous materials or wastes into water, which refers to the act of dumping harmful substances into bodies of water, which may cause significant damage to the aquatic ecosystem, and (ii) violation of the protection of aquatic products, considered as those infractions that affect the conservation and sustainable use of aquatic resources. Penalties for these offenses may include imprisonment of up to 3 years, in addition to fines of which no specific amounts are specified in the legislation.

Additionally, the Civil Code of the People's Republic of China³⁴ establishes relevant rules for compensation for environmental damage, such as (i) compensation for ecological damage, which states that when a violation of state provisions causes damage to the environment, the designated authority has the right to demand compensation from the tortfeasor; and (ii) compensation for pollution, which determines that if the pollution or ecological damage is caused by a third party, the victim may claim compensation from both the tortfeasor and the third party; once compensation is made, the tortfeasor may claim reimbursement from the responsible third party.

The aforementioned cases are resolved through civil public interest litigation, where the concept of punitive damages for violations of the ecological environment is applied.³⁵ This approach seeks not only to repair the damage caused, but also to deter future violations and encourage greater environmental responsibility among individuals and companies.

Based on the above, Table 1 presents a comparative table showing, through the review of a case in Colombia and one in China, how the authorities in both countries determine liability for environmental damage in maritime activities.

TABLE 1.
Comparative table of liability for environmental damage in maritime activities in Colombia and China

COLOMBIA	CHINA
Description of events	
<p>Name of sanctioned company: OLEODUCTO CENTRAL S.A. OCENSA S.A.</p> <p>Administrative act with which the sanction was imposed: Resolution No. 0545 of May 27, 2016. Confirmed by Resolution 687 of June 15, 2017. Executed June 28, 2017.</p> <p>Authority: National Environmental Licensing Authority</p> <p>Event and/or fact: Oil spill that occurred on July 20, 2014, in coastal area.</p> <p>Causes of spillage: "it is considered that OCENSA S.A. allegedly failed to comply with the provisions of section 2.5.3 "CONVOCATION OF THE LOCAL PLAN COORDINATING GROUP - NATIONAL OPERATIONAL COMMITTEE LEVEL III". Of the Operational Plan of the Contingency Plan against spills of Hydrocarbons, Derivatives and Harmful Substances in Marine, River and Lake Waters, since the control and mitigation activities implemented by the Company in the attention of the oil spill occurred on July 20, 2014 during the loading activity of the tanker Eurochampion in the monobuoy TLU - 2, at the coordinates magnas sirgas origin west central east 1142850 and north 1541849, caused by abnormal weather</p>	<p>Name of sanctioned company: owners of the "Tasman Sea" (Infinity Shipping) and its insurer, the London Protection and Indemnity Club.</p> <p>Authority: Tianjin Maritime Court</p> <p>Event and/or fact: Oil tanker oil spill in Bohai Bay near Tianjin, China</p> <p>Causes of spillage: The Maltese-registered "Tasman Sea" was loaded with 81,398 tons of crude oil for China International United Petroleum & Chemicals Co., Ltd. About 160 tons of crude oil was leaking into the waters. The area affected by the oil spill was 359.6 km².</p>

<p>conditions, were not implemented in a timely and immediate manner once the weather conditions allowed verifying if the loss of containment of the loading hoses of the tanker presented hydrocarbon leakage”.</p>	
<p>Environmental damage</p>	
<p>Description of the environmental impact: “With the spill, a patch of crude oil was generated, which moved in a north-northeast direction toward the beaches of the San Bernardo Archipelago, putting at risk the Protected Marine Area of the Rosario and San Bernardo Archipelagos, as well as the Natural National Park of the Rosario and San Bernardo Corals and the Natural Reserve of the Civil Society Sanguaré. [...] The probability that the time natural resources [...] and marine ecosystems (Coral Reefs, Fishing Biological Activity, Mangrove Areas, and Benthic Community) were exposed would result in an impact on them is assessed as low, considering that once the mitigation and recovery activities by the Company were completed, no surface presence of hydrocarbons was evident, and according to the physicochemical monitoring of seawater, hydrobiological assessments, and sediments and seagrasses presented by the company (File 4120-El-50017 dated September 17, 2014), no presence of hydrocarbons was recorded.”</p> <p>Amount of barrels spilled: sixty-nine (69) barrels.</p>	<p>Description of the environmental impact: A collision in the early morning hours of November 23, 2002 between the “Tasman Sea”, a Maltese tanker loaded with 81,000 tons of crude oil and a Chinese ship, the “Shunkai No.1” triggered a massive oil spill. The spill caused severe pollution in the waters of Tianjin port and part of the Bay Area near the city of Tangshan, leaving behind a heavily polluted maritime ecological system. According to official reports, the oil spill measured 2.5 nautical miles long and 1.4 nautical miles wide in the Bohai Sea.</p> <p>Amount of barrels spilled: Around 160 tons of crude oil were leaking into the waters.</p> <p>Location where the spill occurred: Bohai Bay near Tianjin, China - Dagukou Sea Area.</p>

<p>Region, Department, and municipality (location where the spill occurred): Coastal zone in the islands of the San Bernardo Archipelago, belonging to the jurisdiction of Cartagena de Indias, Bolívar, in the Caribbean region.</p>	
<p>Sanctions</p>	
<p>Description of the sanction: “To declare responsible the company OLEODUCTO CENTRAL S.A. - OCENSA S.A., with NIT. 800.251.163- 0, legally represented by LUISA FERNANDA LAFAURIE RIVERA or by whoever takes her place, of the single charge formulated by Order No. 1857 of May 13, 2015”. Consequently “To impose to the company OLEODUCTO CENTRAL S.A. - OCENSA S.A., through its Legal Representative, Mrs. LUISA FERNANDA LAFAURIE RIVERA or whoever acts in her stead, a fine in the amount of ONE HUNDRED SEVENTY MILLION FOUR HUNDRED EIGHTY-SEVEN THOUSAND EIGHT HUNDRED FOUR MONEY CURRENT CURRENCY PESOS (\$170,487,804 pesos), for the infraction related to the single charge formulated in Order No. 1857 of May 13, 2015.</p>	<p>Description of the sanction: On December 30, 2004, after two years of investigation, the Tianjin Maritime Court ordered the two defendants to pay a total compensation of 42.9 million yuan (US\$ 6.7 million) to the plaintiffs. More than 17 million yuan (US\$2.6 million) was ordered to be paid to the group of 1,490 fishermen plaintiffs, who had been affected by the spill. More than 15 million yuan (US\$ 2.3 million) was allocated to the Tianjin Fisheries Bureau and the Tianjin Fisheries Bureau for losses to fishery resources. Nearly 10 million yuan (US\$1.5 million) in compensation was allocated to the Tianjin Maritime Bureau. Of which 7.5 million yuan was earmarked to compensate for the loss of environmental capacity and 2.5 million yuan to compensate for research costs.</p>

Source: Own elaboration, taken from Resolution 0545 of 2016 ³⁶ and Atlas of Environmental Justice 2019. ³⁷

An analysis of environmental legislation in Colombia and China shows that both countries share a significant commitment to environmental protection, although their approaches and legal frameworks differ significantly. Colombia has ratified multiple international conventions regulating marine pollution, reflecting a proactive effort to protect its coastal ecosystems. In contrast, Colombia has also adopted international commitments, but its legislative approach is based more on domestic regulation than on explicitly integrating environmental rights into its constitution.

A key difference lies in how each country addresses the right to the environment. In Colombia, the Political Constitution establishes this right as fundamental, allowing citizens to act legally to protect it. This contrasts with China’s Constitution, which does not explicitly recognize this right, although it does impose responsibilities on the state to protect it. This difference may influence the effectiveness of legal actions taken by citizens in each country.

From a methodological perspective, it is crucial to recognize the inherent limitations of legal procedures in both contexts. In Colombia, the sanctioning framework established by Law 1333 of 2009 allows for a robust administrative procedure to address environmental infractions; however, sanctions may not always be effective due to lack of resources for implementation. On the other hand, in China, although there are criminal sanctions for environmental offenses, as described in the Criminal Law of People's Republic of China of 2020, effective enforcement of these laws may be hampered by local and regional factors that affect their implementation.

The most novel findings include recognition of the interdependence between economic growth and environmental health in both nations. While Colombia has developed a comprehensive legal framework that promotes both sustainable development and social responsibility, China has begun to integrate environmental considerations into its economic policy, although it still faces significant challenges in terms of effective implementation of these regulations.

Conclusion

Research on liability for environmental damage in Colombia and China has revealed significant findings that contribute to the understanding of environmental legislation in both countries. The main objective of this study was to analyze the regulations and measures adopted to protect the marine and coastal environment, as well as the penalties applicable for environmental damage.

First, it was found that Colombia and China share a commitment to environmental protection, evidenced by their adherence to international treaties and the implementation of national laws that regulate pollution and promote sustainability. In Colombia, environmental legislation is based on a robust framework that includes the National Code of Renewable Natural Resources and various laws that establish both criminal and administrative sanctions for environmental infractions. China, on the other hand, has developed a legal framework that, although less explicit in terms of environmental rights, seeks to balance economic development with conservation through specific regulations.

These results underscore the relevance and practical implications of environmental legislations in both contexts. The research not only contributes to the field of environmental law, but also provides a basis for future research on how these legal frameworks can evolve to address emerging environmental challenges. In conclusion, the study reaffirms the importance of effective and adaptable environmental legislation that ensures environmental protection and encourages greater social responsibility at both the state and individual levels.

For future studies, it is essential to investigate how constitutional differences influence the effectiveness of environmental policies and to explore models of international cooperation that can facilitate the exchange of best practices between countries with different legal contexts. In addition, it is recommended to deepen the comparative analysis of criminal and administrative sanctions applied in both countries to evaluate their real impact on environmental protection.

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Notes

* Research paper

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