Analysis of State Liability for Transboundary Pollution Infringements

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Abstract. In 2021, Japan commenced the discharge of treated Fukushima nuclear wastewater into the ocean, sparking global debate on the attribution of liability for transboundary pollution. This paper uses the nuclear wastewater incident as a point of entry to analyse the challenges faced by traditional private law remedies in determining liable parties and applying legal provisions. It explores the introduction and refinement of state responsibility in transboundary pollution scenarios. Through a synthesis of jurisprudential inquiry and normative analysis, it reveals the failure of remedies stemming from the polluter pays principle, jurisdictional conflicts, and fragmented international law. Consequently, it argues for the necessity of supplementing regulatory shortcomings with state liability. Substantively, the research proposes classifying pollution risks and linking them to a duty of due diligence, introducing presumptive causation and shifting the burden of proof. Procedurally, it advocates for a global specialised convention, establishing diversified mechanisms for resource compensation and financial indemnification, alongside promoting bilateral early-warning systems and big-data sharing networks. This aims to provide operational normative solutions for resolving ambiguities in transboundary pollution liability, offering legal rationale and strategic guidance for China's participation in global environmental governance and the construction of a community with a shared future for mankind.

Keywords: International law, transboundary pollution, state responsibility, environmental liability.

1. Introduction

On 13 April 2021, the Japanese government formally approved Tokyo Electric Power Company's plan to discharge millions of tonnes of diluted radioactive wastewater into the ocean. By 7 August 2025, the company had formally commenced the 14th round of ocean discharge operations from the Fukushima Daiichi Nuclear Power Station. This action has triggered a wave of global protests and drawn academic attention, prompting numerous scholars to focus on the legal liabilities a state incurs when committing transboundary pollution acts, the challenges in assigning responsibility, and the implications for neighbouring nations and the international community. For instance, scholarly research indicates that traditional civil tort liability frameworks exhibit limitations when addressing transboundary pollution torts. The polluter pays principle faces challenges, the construction and application of liability principles diverge from established precedents, and existing jurisdictional norms are being tested [1]. Other scholars contend that in practice, the international legal foundation for state liability in transboundary pollution torts remains unsystematised. The International Court of Justice often adopts a conservative stance regarding the elements constituting such torts and the principles of attribution, tending to interpret harm as actual damage. This approach is ill-suited to the latent nature of environmental pollution torts [2]. Furthermore, the burden of proof placed on plaintiffs remains disproportionately heavy. In summary, within the current international legal framework, institutional limitations concerning attribution principles, jurisdiction, evidentiary requirements, and the recognition of potential harm render the effective establishment and implementation of state responsibility for transboundary pollution difficult, thereby complicating liability allocation. Therefore, grounded in current international legal norms, this research employs textual analysis and jurisprudential inquiry. It commences by defining

the concept of transboundary pollution, identifies the limitations of traditional civil liability and the international legal framework, and emphasises the necessity of introducing state responsibility. It further dissects the inadequacies of existing elements of state responsibility and attribution principles. Finally, it clarifies the supplementary nature of state responsibility, refines the constituent elements, and establishes an attribution principle based on presumption of harm and reversal of the burden of proof. This aims to optimise the mechanism for determining and bearing state responsibility in the context of transboundary pollution.

2. Literature Review

Transboundary pollution, as a significant challenge in global environmental governance, has long faced difficulties in establishing liability and a lack of remedial pathways. Firstly, the institutional framework for determining state responsibility in environmental pollution issues remains incomplete, with no binding international treaties or norms to effectively constrain state behaviour. Furthermore, challenges exist in establishing state responsibility in practice, as transboundary pollution may result from state actions or private entities; whether deliberate or inadvertent, may involve the discharge of harmful substances into the environment, authorised or otherwise. This ambiguity in liability attribution impedes effective constraints on state conduct [3]. Secondly, states constitute the primary litigants before the International Court of Justice, leaving individual victims often unable to seek redress through international channels. In handling such cross-border civil litigation, jurisdictional conflicts, inconsistent application of law, and evidentiary difficulties further constrain proceedings. Moreover, many multinational corporations can evade liability by leveraging the limited liability framework of their subsidiaries [4]. Given this landscape, most scholars contend that state responsibility remains indispensable. Governments bear regulatory and preventive obligations over domestic activities, and a singular liability mechanism proves insufficient.

Therefore, while establishing domestic oversight of corporate environmental conduct and overcoming limitations in proving traditional environmental tort causation, international cooperation must be strengthened. National reluctance to assume strict liability due to self-interest hinders the advancement and implementation of liability mechanisms. Breaking new ground through collaborative models is essential to rectify the shortcomings of traditional accountability frameworks [5].

3. Limitations on the Application of Civil Liability for Tort in Cross-Border Pollution Cases and the Necessity of Introducing State Liability

3.1. Limitations on the Application of Civil Liability for Tort

3.1.1 Limitations of the polluter pays principle

The polluter pays principle stands as a cornerstone of contemporary environmental law. Its fundamental tenet holds that liability for environmental damage should rest with the entity causing such harm, thereby preventing the shifting of responsibility onto governments or the public [1]. This principle addresses the issue of liability allocation in environmental torts. When environmental damage occurs within a single nation's borders, the polluter pays principle is widely recognised as an effective approach–for instance, liability for pollution is typically borne by the discharging enterprise. However, when pollution activities trigger transboundary issues, this principle becomes mired in disputes over who should bear responsibility. For instance, multinational corporations frequently employ offshore subsidiaries, special purpose vehicles, or supply chain outsourcing models. Should pollution occur at downstream factories or suppliers, parent companies can leverage limited liability structures to insulate themselves from legal risks. This renders it difficult for

victims in the host country to pierce the corporate veil and hold the actual decision-makers and beneficiaries accountable.

Transboundary pollution involves multiple nations, where relevant parties extend beyond the polluting and polluted civil entities to include governments of different countries. Within a single nation, the polluter pays principle effectively internalises external costs. However, in transboundary pollution, governmental decision-making and regulatory actions must be considered. The conduct of civil entities within a state and its subsequent impacts are intrinsically linked to that nation's environmental policies, while the dimensions of beneficiaries or victims are elevated to the national level. Attributing transboundary pollution liability solely to civil entities without regulating governmental conduct fails to resolve the issue substantively. Therefore, addressing transboundary pollution necessitates the introduction of state responsibility.

3.1.2 Conflict in interregional legal application

Owing to divergent legal systems, continued reliance on civil tort liability in transboundary pollution cases will provoke disputes over the choice of applicable law. For instance, it is common for the location of the act and the location where the consequences manifest to be inconsistent in such cases – that is, pollutants are emitted in one country, but environmental damage occurs in a neighbouring state. Different nations interpret the ‘place of the tortious act’ differently, with divergences existing between the place of the tortious act and the place where the consequences occur. Article 44 of China's Law on the Application of Laws to Foreign-Related Civil Relations does not explicitly clarify whether ‘place of tort’ refers to the location of the act or the location of the consequences, and judicial interpretations remain incomplete. This ambiguity leads to inconsistent application standards by courts, increasing uncertainty in legal application [2]. Furthermore, Article 1129 of the Civil Code of the People's Republic of China establishes a strict liability principle for environmental torts, meaning environmental damage issues uniformly apply strict liability [3]. In contrast, the EU Environmental Liability Directive establishes a dual liability structure, categorising environmentally harmful acts into hazardous and non-hazardous conduct. The former is governed by strict liability, while the latter operates under fault-based liability [4]. Faced with these divergences, determining how to select applicable law and justify its selection, alongside advancing cooperation among nations in cross-border damage disputes, presents challenges that cannot be resolved solely through domestic civil tort liability regimes.

3.1.3 Conflict in interregional legal application

Provisions concerning transboundary pollution in international law remain fragmented, dispersed across customary law, general legal principles, and various global or regional treaties. Article 235 of the United Nations Convention on the Law of the Sea stipulates that States bear the responsibility to fulfil international obligations for protecting the marine environment. Where natural or legal persons under their jurisdiction cause marine environmental damage, claims may be brought under their legal systems to obtain prompt and adequate compensation or redress. Article 3 of the Convention on Biological Diversity establishes the principle that States shall ensure that activities under their jurisdiction or control do not cause damage to the environment of other States. However, such provisions generally lack specific liability and compensation mechanisms and have not yet attained binding force. While case law such as the Trellis Smelter case indicates support for the principle that ‘States shall not cause damage to the environment of other States,’ it has not yet developed into a universally binding rule of customary law. Where a State fails to exercise due diligence in regulating civil entities within its jurisdiction, victims face difficulties in directly invoking international law to seek State compensation. In the absence of uniform substantive rules, civil remedies for transboundary pollution primarily rely on domestic laws, preventing the establishment of a comprehensive liability chain encompassing prevention, remediation, compensation, and punishment.

3.2. The Necessity of Introducing State Responsibility for Transboundary Pollution and Its Legal Analysis

3.2.1 The necessity of introducing state responsibility

In cases of transboundary pollution, civil tort liability faces difficulties in selecting liable parties and applying applicable laws. Consequently, there is a need to establish a more unified system of rules based on existing international law, rendering the introduction of state responsibility necessary. The distinctive nature of transboundary pollution results in disputes that are extensive in scope, involving complex entities and legal frameworks. Compared to relying on individual civil entities to seek redress under fragmented and weakly binding legal rules, introducing state responsibility in transboundary pollution liability addresses the absence of state actors. It leverages the state's regulatory and supervisory functions over domestic civil entities, compels states to fulfil their environmental protection obligations, and facilitates the simplification of transboundary issues while enhancing communication and compensation capabilities.

3.2.2 Jurisprudential analysis of state responsibility for transboundary pollution

The theoretical framework and practical application of state responsibility in transboundary pollution contexts remain underdeveloped. Unlike traditional state liability, transboundary pollution constitutes cross-border harm, thereby positioning transboundary pollution liability as a subset of state responsibility for transboundary damage [5].

Regarding the nature of liability, the relationship between state responsibility and civil liability must be addressed. Concerning the elements of liability, cross-border pollution state responsibility primarily involves discussions on tortious conduct, harmful consequences, and the causal link between the two. Significant controversies exist over the identification of internationally wrongful acts by states, whether harmful consequences encompass potential risks, and how to assess the causal relationship between conduct and harm. Concerning the attribution principle, divergent positions exist among states regarding the adoption of strict liability as the basis for liability. Developing countries express concern that strict liability may constrain their developmental space, whereas developed nations tend to favour strengthening environmental obligations.

4. Pathways for Enhancing State Liability for Transboundary Pollution

4.1. State Responsibility

The Draft Articles on the Responsibility of States for Internationally Wrongful Acts formulated by the United Nations International Law Commission emphasise the significance of the act itself in defining wrongful conduct. Within the international community, when environmental pollution incidents affecting multiple nations occur, states as the primary bearers of responsibility often find themselves at the centre of international conflicts and disputes over the extent of their obligations and the balancing of national interests against those of other states and the international community. Throughout the evolution of international law, the introduction of the concept of "due diligence" has provided general normative guidance for actions under the jurisdiction or control of states that may cause transboundary effects [6]. Due diligence typically denotes a legal obligation of conduct; failure to fulfil this obligation often implies negligence or culpability [7]. Lassalle Oppenheim noted that states bear a duty of diligence to prevent private actors from committing international wrongful acts. Should such acts occur, states must take necessary measures and endeavour to secure compensation for the injured state. Failure to fulfil this duty of diligence renders a state liable and obliges it to pay damages [8].

4.2. International Law Framework

Within the international community, major organisations led by the United Nations may establish specialised global conventions addressing transboundary pollution, categorised by

pollutant type, to unify principles of state accountability. Liability for transboundary harm constitutes one aspect of state responsibility under contemporary international law, serving to supplement and refine existing frameworks.

Distinguishing between "high-risk pollutants"—such as nuclear contamination, toxic chemicals, and hazardous waste—and "low-risk pollutants"—such as agricultural non-point source pollution and minor dust storms. Linking the extent of a state's liability to the severity of the specific pollution incident, imposing compensation obligations, and expanding compensation methods. These may include direct resource restoration, financial compensation, or mutually agreed compensation arrangements. Furthermore, introduce the principles of "presumed causation" and "burden of proof reversal". This requires the polluting state to demonstrate that its actions are unrelated to the damage; otherwise, a causal link between the polluting entity and the harm is presumed. In practice, due to the inherent complexity of transboundary pollution, causation is rarely straightforward. Plaintiffs often face significant difficulties in gathering conclusive evidence proving the necessary connection between pollution and harm. Shifting the burden of proof appropriately to the defendant addresses this challenge.

4.3. International Cooperation Level

Legal safeguards against transboundary environmental pollution constitute an integrated suite of measures [9]. This includes establishing early warning and emergency response coordination mechanisms for transboundary pollution. Bilateral or multilateral cooperation should be promoted, with neighbouring states signing "transboundary pollution cooperation agreements" and establishing "joint monitoring networks" to enable real-time data sharing. Strengthen capacity building in developing countries. Addressing transboundary pollution must account for disparities in economic capacity and national strength among nations. Developing countries, often in the early stages of industrialisation with immature production technologies, face greater pressure to balance environmental protection and economic growth. When requiring them to bear transboundary pollution liabilities, more flexible approaches to responsibility sharing may be necessary to sustain their development momentum [10]. Developed nations can thereby provide "technical assistance" and "financial support" to enhance developing countries' capabilities in transboundary pollution prevention, thereby reducing pollution and liability disputes arising from "technological inadequacies".

5. Conclusion

This paper employs a literature review methodology to analyse existing approaches to resolving transboundary pollution issues and highlights the limitations inherent in current solutions. At the private law level, the fundamental principle of environmental law applied within individual nations—the polluter pays principle—proves effective. However, within the international community, divergent legal cultures and traditions among states give rise to disputes when conflicts arise between two or more national entities. Controversy persists over which party should bear environmental liability and the rationale for such liability. Consequently, the introduction of state responsibility is necessary, with consideration given to establishing strict liability for such state responsibility. Moreover, considering the operational objectives and implementation outcomes of international environmental law, private law remedies remain limited and inadequate. This necessitates invoking state responsibility to secure compensation. Only after prioritising the development of state responsibility mechanisms and when predetermined objectives prove unattainable should private law remedies serve as a compromise. Looking ahead, the international community should prioritise cooperative approaches, recognising that in an interconnected world, sustainable environmental protection is not only vital for individual nations but fundamental to the well-being of the planet.

Author Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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