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Post-Consent Regulatory Vacuum under the Basel Convention and the Cask Effect on Global Ecological Security

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ABSTRACT

The Prior Informed Consent (PIC) procedure is the core mechanism of the Basel Convention for controlling transboundary movements of hazardous wastes. However, it harbors a deep-seated loophole: while the procedure ensures the importing country's consent, it cannot guarantee that the importing country possesses the capacity for environmentally sound management, thus creating a post-consent regulatory vacuum. Based on UN COMTRADE data on waste plastic trade from 2016 to 2018, combined with normative analysis, this paper demonstrates how this loophole enables the legal transfer of pollution to countries with weak governance capacities, and how crude disposal methods and cross-media diffusion lower the overall level of global ecological security. The study introduces the cask effect framework, arguing that the level of global ecological security is determined not by the country with the strongest governance capacity, but by the country with the weakest governance capacity (the short plank). Following China's 2017 National Sword policy, waste plastic imports to Malaysia, Thailand, Vietnam, Tanzania, and other countries surged by 200% to 500%. Approximately 60% of these imported wastes were openly burned or illegally dumped. The resulting persistent organic pollutants and microplastics have adversely affected regional and global environments through atmospheric circulation and ocean currents. This paper accordingly proposes a tiered reform pathway: establishing a cross-border monitoring network in the short term, introducing third-party auditing in the medium term, and establishing extended producer responsibility for exporting countries in the long term.

KEYWORDS

Basel convention; Prior informed consent procedure; Post-consent regulatory vacuum; Cask effect; Global ecological security

1 Problem Statement

Following China's implementation of the National Sword policy in 2017, domestic pollutant emissions declined significantly. However, the total global trade volume of waste plastics did not decrease; instead, it accelerated its flow towards developing countries in Southeast Asia and Africa with weaker governance capacities. This contrast reveals a profound institutional paradox: the global waste governance system, centered on the Basel Convention's Prior Informed Consent procedure, successfully secures the importing country's consent but fails to ensure that the importing country possesses the actual capacity for environmentally sound waste disposal. Pollution has not disappeared; it has merely been transferred from a longer plank to a shorter one.

This phenomenon raises a fundamental question: Does the Prior Informed Consent procedure under the Basel Convention harbor a post-consent regulatory vacuum? If so, how does it affect the overall level of global ecological security?

Since the intensification of transboundary hazardous waste movements in the 1980s, the Basel Convention has remained the primary international legal instrument for regulating cross-border waste flows. The Convention's core mechanism—the Prior Informed Consent procedure—requires the exporting country to provide detailed notifications to the importing country prior to waste transfer, and transfer may proceed only upon the importing country's explicit written consent. Formally, this procedure encompasses three stages—notification, information exchange, and autonomous decision-making—embodying principles of international cooperation, prior prevention, and respect for national sovereignty. However, there exists a fundamental disconnect between the institutional logic and practical outcomes.

According to UN COMTRADE data, after China's ban, the global trade flow of waste plastics rapidly restructured: Malaysia's imports in 2018 increased by approximately 300% compared to 2016, Thailand by approximately 233%, Vietnam by approximately 350%, and Tanzania by as much as 500%. Southeast Asia receives 20 to 30 million tons of waste annually, of which only about 40% can be recycled; the remaining 60% is illegally dumped or openly burned. Malaysia has already closed 175 primitive landfills due to saturation. These facts demonstrate that consent does not equate to safe disposal. Importing countries may grant consent for economic reasons but lack the capacity for harmless treatment, resulting in secondary pollution.

Existing research has notable limitations. Domestic studies focus on the domestic environmental effects of the ban, neglecting the global externalities. Research on the Convention's mechanisms points out procedural deficiencies but fails to examine the consequences. Studies on pollution transfer describe flow patterns but do not establish causal links with institutional loopholes. This paper introduces the cask effect analytical framework to systematically link domestic

governance logic with international rule deficiencies, revealing how the post-consent regulatory vacuum lowers the level of global ecological security.

2 Normative Analysis of the Post-Consent Regulatory Vacuum

The Prior Informed Consent procedure entails three dimensions. Prior requires the exporting country to issue notification before transfer, reflecting prior prevention. Informed requires the provision of information on waste characteristics, quantity, and disposal methods, enabling the importing country to fully understand the situation. Consent requires the importing country's explicit written affirmation, respecting national sovereignty. However, the Convention concerns itself only with whether consent is given and does not establish subsequent monitoring mechanisms to ensure whether harmless treatment is achievable, creating a procedure-heavy, substance-light disconnect—what this paper terms the post-consent regulatory vacuum.

This loophole can be defined at two levels. First, the ambiguity of treaty text. Article 4, paragraphs 2(g) and (h) of the Convention employ vague language such as has reason to believe, which neither specifies clear criteria nor grants exporting countries the authority to actively verify the importing country's treatment facilities. Second, the difficulty of capacity assessment. Most importing countries are developing nations with backward disposal technologies and inadequate facilities, making it difficult to accurately assess waste hazards. Furthermore, imports can generate foreign exchange revenue, potentially leading competent authorities to exaggerate disposal capacities or even engage in corruption. The 1988 Koko incident in Nigeria and the 2006 toxic waste incident in Côte d'Ivoire serve as typical examples.

A clear distinction must be made between treaty loopholes and implementation failures. The latter refers to situations where the Convention has clear provisions but parties fail to comply; the former refers to the absence of rules themselves —the post-consent regulatory vacuum falls into the category of matters not addressed by the rules. Remedying this loophole requires treaty amendments or progressive rule development through Conference of the Parties (COP) decisions, entailing fundamentally different reform pathways.

3 Empirical Tracing of Pollution Transfer

3.1 Restructuring of Global Trade Chains after China's Ban

Following the initiation of China's National Sword policy in 2017, exporters rapidly shifted their operations to Southeast Asian and African countries with weaker regulatory and disposal capacities. Changes in import volumes for major recipient countries are shown in Table 1.

Table 1 Changes in Waste Plastic Import Volumes of Major Recipient Countries (2016 vs. 2018)

Country	2016 (10,000 tons)	2018 (10,000 tons)	Increase
Malaysia	20	80	300%
Thailand	15	50	233%
Vietnam	10	45	350%
Tanzania	2	12	500%

Source: UN COMTRADE / Chunsuttiwat and Coxhead (2024)

The data reveals a clear substitution effect—as China closed one door, pollution poured in through other windows. Tanzania, which recorded the highest increase, also happens to be the country with the weakest governance capacity; its Environmental Performance Index waste management sub-score is less than 40% of the global average, confirming the trend of pollution shifting towards the short plank.

3.2 Recipient Country Governance Capacity and Pollution Consequences

The governance capacity of recipient countries is severely inadequate. Southeast Asia imports 20 to 30 million tons of waste annually, with only 40% being recyclable and 60% illegally dumped or openly burned. Malaysia closed 175 primitive landfills in 2024, with 154 still operating, receiving nearly 40,000 tons of waste daily.

The pollution consequences have been verified across multiple dimensions. Heavy metals such as cadmium and lead have been found around Pulau Indah landfill in Malaysia, potentially causing cardiovascular and respiratory diseases. In Kedah state, respiratory cases increased significantly during periods of intense plastic burning. In the Philippines, the influx of plastic waste has led to illnesses among Manila residents and coastline blockages. Indonesia's Ecoton organization has monitored river microplastic concentrations exceeding acceptable levels by tens of times.

More importantly, this pollution exhibits transboundary dispersal characteristics. Open burning releases persistent

organic pollutants such as dioxins and furans, which cross borders via atmospheric circulation. Studies indicate that biomass burning in Southeast Asia (including plastic burning) contributes 15% to 25% of wintertime PM2.5 in South China. Microplastics discharged directly into rivers form marine plastic pollution zones through ocean currents, with over 90% of marine plastics globally originating from 10 rivers, 8 of which are in Asia.

4 The Cask Effect: A Mechanism for Explaining the Decline of Global Ecological Security

4.1 Theoretical Framework

The cask effect posits that the water-holding capacity of a cask is determined by its shortest plank. The level of global ecological security is determined not by the country with the strongest governance capacity, but by the country with the weakest governance capacity (the short plank). This proposition can be traced to the weakest link problem in global public goods governance (Barrett, 2007)—the transboundary mobility of pollutants means that any leakage from a short plank affects all countries. This paper formalizes the level of global ecological security as $S = \min(G_1, G_2, ..., G_n)$, where G_i represents the environmentally sound management capacity of country i.

This framework transcends two traditional narratives: first, it moves beyond the pollution haven hypothesis (which explains motivations rather than consequences); second, it transcends the North-South antagonism narrative (focusing on governance capacity differences rather than positional conflicts).

4.2 Intermediary Mechanisms and Transboundary Diffusion

The post-consent regulatory vacuum leads to a decline in global ecological security through two intermediary variables. First, corruption and regulatory capacity in importing countries—the absence of liability and the low cost of non-compliance may lead importing countries to exaggerate their disposal capacities. Second, the level of due diligence by exporting countries—the Convention does not grant exporting countries the authority to actively verify, and in practice, exporting countries rarely exercise their limited review obligations.

Leakage from short planks transmits through three media. Atmospheric pathway: open burning releases dioxins and furans, affecting regions thousands of kilometers away through atmospheric circulation. Oceanic pathway: microplastics discharged directly into rivers are transported by ocean currents, entering the global food chain. Transboundary water pathway: polluted water bodies cross borders, conveying heavy metals and organic compounds to downstream countries.

4.3 Core Conclusion

This forms a complete causal chain: post-consent regulatory vacuum → legal transfer of pollution to countries with weak governance capacities → crude disposal by short-plank countries → transboundary pollution diffusion → lowering of the global ecological security baseline.

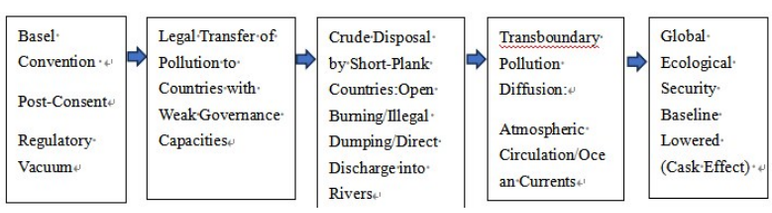

Figure 1

No matter how well the long-plank countries manage their environments, they cannot isolate themselves from pollution inputs originating from the short planks. Pollution has not disappeared; it has merely shifted from a relatively longer plank (China) to a shorter one.

5 Pathways for Institutional Reform

Remedying the "post-consent regulatory vacuum" requires a tiered approach.

Short-term: Establish a cross-border environmental monitoring network. Utilizing existing satellite remote sensing, atmospheric pollutant monitoring, and marine microplastic monitoring technologies, add a waste disposal monitoring module under the UN Environment Programme's Global Environment Monitoring System. The obstacle lies in the low willingness of some developing countries to share data; the breakthrough path is to use funding and technical assistance in exchange for data access. China can take the lead in promoting bilateral monitoring cooperation with Southeast Asian

countries under the Belt and Road green investment framework.

Medium-term: Introduce third-party auditing and extended producer responsibility for exporting countries. Drawing on the EU's Waste Shipment Regulation (EU 2021/2027), require exporting countries to commission independent third parties to conduct annual audits of recipient countries' treatment facilities, with audit reports submitted to the Convention Secretariat for filing. If a recipient country's actual capacity is found to be insufficient, the exporting country should bear the obligation to take back the waste or provide technical assistance for capacity improvement. Start with voluntary pilot programs and gradually scale up.

Long-term: Amend the Convention's annexes to establish the obligation to guarantee environmentally sound management. Explicitly require importing countries to submit documentary evidence of environmentally sound management capacity (treatment facility permits, environmental impact assessments, disposal contracts, etc.). Simultaneously, promote the entry into force of the Liability and Compensation Protocol and establish a joint and several liability compensation mechanism. During revision negotiations, differentiated liability standards could be established, reducing the liability ratio for exporting countries that have already established audit systems.

Supplementary recommendation: Strengthen the Compliance Committee's proactive investigation authority, allowing the Secretariat to initiate compliance reviews for countries that are high-frequency recipients but low-capacity. This can be implemented through COP decisions with relatively low political resistance.

6 Conclusion

The Prior Informed Consent procedure is an important institution of international environmental law. However, this study demonstrates that the procedure harbors a deep-seated loophole—the post-consent regulatory vacuum. This loophole enables the legal transfer of pollution to countries with weak governance capacities and significantly lowers the overall level of global ecological security through the cask effect. The flow of waste plastic trade following China's 2017 National Sword policy provides ample corroboration: Malaysia, Thailand, Vietnam, Tanzania, and other countries experienced sharp increases in waste plastic imports, but their landfill capacities rapidly became saturated, forcing large quantities of waste to be openly burned or illegally dumped, with transboundary pollution affecting regional and even global environments through atmospheric and oceanic circulation.

The findings of this paper carry implications for China's policy choices. Although China has kept waste out of its borders through the ban, the transfer of pollution to short planks can affect China in reverse through transboundary media. Therefore, China needs to shift from a defensive strategy to a proactive engagement strategy: in the short term, promote the establishment of cross-border monitoring networks; in the medium term, cooperate with Southeast Asian countries on treatment facility audits and capacity-building assistance; and in the long term, take the lead in negotiating the establishment of extended producer responsibility systems for exporting countries within the Convention framework. Remedying the short planks in global environmental governance is not only a practice of the vision of a community with a shared future for mankind but also a rational choice for safeguarding China's own ecological security.

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