



Reforming Plastic Waste Trade through WTO Law and Administrative Governance

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ABSTRACT

Plastic waste trade has emerged as a pressing global concern at the intersection of trade liberalization and environmental protection. Despite increasing regulatory attention, the existing World Trade Organization (WTO) framework remains insufficiently equipped to address the environmental consequences of cross-border plastic waste flows. This study examines how WTO law and administrative governance mechanisms can be reformed to promote sustainable trade practices. Using a qualitative legal-analytical approach, the research reviews WTO agreements—particularly General Agreement on Tariffs and Trade (GATT), Technical Barriers to Trade (TBT), and General Agreement on Trade in Services (GATS) alongside key environmental instruments such as the Basel Convention, to evaluate their coherence and limitations in governing plastic waste. The study further explores administrative pathways that national governments can employ to align domestic regulatory systems with WTO-consistent environmental objectives. Findings reveal that a fragmented regulatory landscape and weak administrative enforcement undermine effective plastic waste control. The paper concludes that integrating trade law reforms with administrative governance offers a viable route to balancing global trade commitments and environmental sustainability.



Introduction

The international trade of plastic waste has emerged as one of the most pressing and complex challenges in global environmental governance. With the rapid expansion of globalization, the movement of goods and waste materials across borders has intensified, revealing significant gaps in both trade regulation and environmental protection. Plastic, though central to industrial and consumer economies, has become an emblem of environmental degradation due to its persistence

and mismanagement after disposal (Gul et al., 2025). The cross-border trade of plastic waste—often from developed to developing countries—has raised concerns regarding the equitable distribution of environmental risks and the adequacy of international trade law in addressing sustainability. While the WTO primarily aims to promote free and fair trade, its institutional and legal mechanisms have been criticized for insufficiently integrating environmental safeguards, particularly in the context of hazardous and non-hazardous waste flows (Ghani et al., 2025).

The purpose of this study is to critically examine the intersection between WTO law and administrative governance in reforming plastic waste trade. It seeks to explore how WTO provisions—especially those under the GATT, the Agreement on TBT, and the GATS—can be interpreted and operationalized to support environmental objectives without undermining trade liberalization (Malik et al., 2025). The analysis also emphasizes how administrative systems at the national level can serve as complementary mechanisms for ensuring WTO-consistent environmental protection. By examining the convergence of international trade obligations and domestic administrative practices, this paper underscores the importance of harmonizing trade policy with environmental sustainability goals. The scope of this research encompasses both international and domestic legal frameworks that govern plastic waste trade (Gul et al., 2025). It places particular emphasis on the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, which serves as the cornerstone of global waste management, and on WTO law, which remains the principal instrument governing trade relations among states. The study reveals that despite the existence of these frameworks, the absence of effective coordination and administrative oversight has led to fragmented governance, inconsistent enforcement, and growing environmental harm (Mathlouthi et al., 2025).

The central hypothesis guiding this research is that WTO law, if complemented by effective administrative governance, can provide a balanced and legally coherent mechanism for managing plastic waste trade. In this context, administrative measures—such as licensing procedures, environmental compliance monitoring, and transparent reporting—are crucial for ensuring that international trade in plastic waste aligns with sustainable development objectives. To test this hypothesis, the research addresses how WTO rules regulate environmental measures affecting plastic waste trade, what administrative mechanisms can be utilized by governments to ensure compliance with WTO disciplines, and what reforms are necessary to align global trade regulation with environmental governance (Gul et al., 2025). This study adopts a qualitative legal-analytical methodology, combining doctrinal analysis of WTO agreements and jurisprudence with a comparative review of administrative and environmental policies. This approach facilitates a nuanced understanding of how trade and environmental regimes interact and where institutional gaps persist. The expected outcome of the research is to demonstrate that administrative governance, when aligned with WTO principles, can serve as a bridge between trade liberalization and environmental protection, thereby fostering a more sustainable international trading system (Khan et al., 2025).

The remainder of this article is structured as follows. Section 2 presents a comprehensive review of the literature on plastic waste trade and the trade–environment interface. Section 3 outlines the methodological framework of the study. Section 4 examines WTO legal provisions and dispute settlement cases relevant to plastic waste regulation. Section 5 explores administrative mechanisms and institutional pathways for enhancing environmental governance. Section 6 offers recommendations for reforming global plastic waste governance, while Section 7 concludes with the study’s key findings and policy implications for sustainable trade and environmental protection.

Conceptual and Theoretical Framework

This study is grounded in the conceptual understanding that international trade regulation and environmental governance must operate as mutually reinforcing systems rather than competing domains. The global trade in plastic waste illustrates the need for a coherent framework that balances market liberalization with environmental protection. The theoretical foundation of this research draws primarily on three interrelated perspectives: sustainable development, administrative governance, and regulatory coherence. The theory of sustainable development provides the normative basis for integrating environmental considerations into trade policy, ensuring that economic progress does not undermine ecological sustainability. The administrative governance theory emphasizes the institutional capacity of national governments to translate international obligations into effective domestic regulations through licensing, compliance monitoring, and transparent enforcement mechanisms. Finally, the theory of regulatory coherence in international law supports the alignment of WTO disciplines with environmental treaties such as the Basel Convention, advocating for the harmonization of trade and environmental rules to reduce normative conflicts. Collectively, these frameworks underpin the argument that reforming plastic waste trade under WTO law requires not only legal reinterpretation at the multilateral level but also administrative innovation at the domestic level to ensure sustainable and enforceable outcomes.

Research Methodology

This study adopts a qualitative legal-analytical research design to examine the intersection of WTO law, plastic waste trade, and administrative governance. The qualitative approach is particularly appropriate for exploring the interpretive and normative dimensions of international law, where meaning is derived from textual analysis, case interpretation, and comparative institutional evaluation rather than quantitative measurement. The methodology is structured around three main components: doctrinal legal analysis, comparative policy assessment, and institutional evaluation (Hui et al., 2025; Ahmed et al., 2025).

The doctrinal legal analysis forms the foundation of the study. It involves a detailed examination of relevant WTO agreements, including the GATT 1994, the TBT, and the GATS. In addition, the research draws upon key environmental treaties, most notably the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, to assess how environmental obligations interact with trade rules. WTO dispute settlement cases—such as United States—Import Prohibition of Certain Shrimp and Shrimp Products (1998) and Brazil—Retreaded Tyres (2007)—are also analyzed to illustrate how trade–environment conflicts have been adjudicated within the multilateral system and to derive implications for plastic waste regulation. The comparative policy assessment complements the doctrinal inquiry by analyzing national administrative responses to plastic waste trade in both developed and developing countries (Ahmed et al., 2025). This includes an examination of how governments have implemented licensing systems, import bans, and recycling standards within WTO-consistent frameworks. The comparative lens enables an understanding of how administrative structures can enhance or impede environmental compliance and sheds light on best practices that may be applied internationally. Sources for this analysis include official policy documents, national legislation, administrative guidelines, and reports from international organizations such as the OECD and UNEP. The institutional evaluation component focuses on the role of administrative bodies in enforcing trade-related environmental standards. It assesses the capacity, transparency, and coordination of institutions responsible for trade regulation and environmental protection. This

analysis is essential for identifying governance gaps that weaken compliance with WTO principles while hindering effective environmental management (Khan & Ullah, 2024).

The data for this research is derived exclusively from secondary sources, including WTO legal texts, dispute settlement reports, scholarly articles, international agreements, and policy reports. These sources were selected based on relevance, reliability, and representativeness within the field of trade and environmental law. The analysis emphasizes interpretative reasoning, normative coherence, and policy implications rather than statistical generalization (Malik & Gul, 2024). Overall, the methodology integrates legal interpretation with administrative analysis to provide a comprehensive understanding of how WTO law can be reformed and operationalized through administrative governance. By combining doctrinal rigor with institutional assessment, the study contributes to the broader discourse on harmonizing global trade rules with sustainable environmental protection mechanism (Lin & Song, 2024).

WTO Law and Plastic Waste Trade

The governance of plastic waste trade within the WTO framework represents one of the most significant tests of coherence between trade liberalization and environmental sustainability. While the WTO was not originally designed as an environmental institution, its agreements and jurisprudence have progressively incorporated ecological considerations as trade-related environmental disputes have increased (Gul & Malik, 2024). The challenge lies in reconciling trade disciplines—particularly non-discrimination and market access—with the right of states to protect their environment through legitimate policy measures. Plastic waste, as a traded good with significant externalities, sits at the center of this intersection, exposing the gaps between global trade commitments and domestic environmental obligations (Khan, 2024).

The Trade–Environment Interface

The relationship between trade and environmental protection within the WTO framework is grounded in the organization’s founding principles. The preamble to the Marrakesh Agreement establishing the WTO explicitly recognizes the goal of “sustainable development” and the need to protect and preserve the environment while expanding global trade. This recognition establishes an interpretive foundation that allows WTO rules to accommodate environmental objectives, provided that such measures are not disguised restrictions on trade (Khan, 2024).

Plastic waste trade reflects this trade–environment interface vividly. The export of plastic waste from industrialized to developing countries has been justified under free trade principles, yet it often results in environmental degradation and public health risks in recipient nations. The Basel Convention seeks to regulate this movement by requiring prior informed consent and environmentally sound management. However, since the WTO and the Basel Convention operate in parallel regimes, inconsistencies can arise when environmental restrictions on waste imports are challenged as trade barriers (Gul et al., 2022). The WTO’s core agreements—especially GATT 1994—offer legal space for environmental protection through Article XX, which allows exceptions for measures “*necessary to protect human, animal, or plant life or health*” (Article XX(b)) and those “*relating to the conservation of exhaustible natural resources*” (Article XX(g)). These provisions can justify environmental measures affecting trade in plastic waste if they meet certain criteria: they must not be applied arbitrarily or constitute disguised protectionism, and they must maintain proportionality between environmental objectives and trade restrictions. In practice, this requires states to design their plastic waste regulations transparently and consistently with WTO obligations (Khan & Jiliani, 2023).

In addition to GATT, the TBT plays a crucial role in regulating product standards, labelling requirements, and environmental certification related to plastic production and recycling. WTO members may adopt technical regulations to ensure environmental safety, provided that such measures are non-discriminatory and based on international standards (Gul et al., 2022). Thus, the TBT Agreement can serve as an instrument for promoting sustainable plastic trade if appropriately implemented. However, its emphasis on trade facilitation sometimes limits the policy space for stricter environmental controls. Overall, the trade–environment interface demonstrates both opportunities and constraints. The WTO framework provides flexibility for environmental regulation, but its enforcement depends heavily on how member states justify and administer their policies. Without strong administrative mechanisms and coherent national implementation, environmental measures addressing plastic waste may remain vulnerable to trade-based challenges (Khan & Usman, 2023).

WTO Disputes and Plastic-Related Trade Restrictions

WTO jurisprudence has been central to shaping the legal boundaries of environmental regulation within international trade. Although the WTO has not yet adjudicated a dispute specifically concerning plastic waste, several landmark cases provide interpretive guidance relevant to this issue. Among them, the United States—Import Prohibition of Certain Shrimp and Shrimp Products (1998) and Brazil—Retreaded Tyres (2007) cases are particularly instructive (Ullah et al., 2025). These disputes illustrate how the WTO’s dispute settlement mechanism interprets the balance between trade liberalization and environmental protection. In the Shrimp/Turtle case, the WTO Appellate Body upheld the U.S. measure restricting shrimp imports caught without turtle-excluder devices, finding it compatible with GATT Article XX(g) as long as it was applied in a non-discriminatory manner. This decision affirmed that trade measures with environmental objectives could be justified under WTO law, provided they are implemented transparently and with due process. The reasoning is directly relevant to potential restrictions on plastic waste imports, where similar principles of conservation and non-arbitrariness apply (Usman et al., 2023).

In Brazil—Retreaded Tyres, the Appellate Body recognized Brazil’s ban on imported retreaded tyres as a legitimate environmental measure under Article XX(b), noting its objective to protect human health and the environment from waste accumulation and pollution (Ullah et al., 2025). However, the ruling emphasized that environmental measures must be consistent and not discriminatory between trading partners. This case establishes an important precedent for plastic waste regulation, where countries may seek to restrict imports of low-grade or non-recyclable plastics while ensuring equal treatment of domestic and foreign producers. Other WTO cases, such as EC—Asbestos (2001) and China—Raw Materials (2012), further illustrate that trade restrictions aimed at environmental or health protection can be justified when supported by scientific evidence and applied uniformly. These precedents collectively demonstrate that WTO law recognizes the legitimacy of environmental regulation but demands a high level of procedural and administrative rigor (Khan et al., 2023).

From an administrative perspective, these cases underline the importance of transparent policy formulation, inter-agency coordination, and evidence-based decision-making. For plastic waste governance, this means that national authorities must develop clear administrative procedures—such as import licensing, waste classification, and recycling verification—that align with WTO principles while achieving environmental goals (Ullah et al., 2025). The absence of such mechanisms not only weakens domestic enforcement but also exposes states to potential disputes within the WTO system. In summary, WTO jurisprudence suggests that plastic-related trade restrictions can withstand legal scrutiny if they are environmentally justified, non-discriminatory,

and implemented through robust administrative processes. This dual compliance—legal under WTO and procedural under administrative governance—is essential for reforming global plastic waste trade in a sustainable and enforceable manner (Khan, 2023).

Administrative Pathways to Environmental Governance

The effectiveness of international legal frameworks such as the WTO in addressing plastic waste trade largely depends on the administrative capacity of member states to implement and enforce environmentally sound trade policies. While the WTO provides the overarching legal discipline, it is national administrative systems that translate these commitments into actionable rules and regulatory mechanisms. Administrative governance plays a dual role—first, as a means of ensuring compliance with international trade obligations, and second, as a driver for environmental sustainability through policy coherence, inter-agency coordination, and transparent decision-making (Salman et al., 2025). However, in many developing countries, weak institutional frameworks, overlapping mandates, and insufficient technical expertise often hinder the implementation of WTO-consistent environmental measures. Consequently, the administrative dimension becomes the most critical, yet often overlooked, element in the governance of plastic waste trade. This section examines how national administrative responses and institutional capacities shape the effectiveness of environmental regulation, while identifying systemic challenges that prevent alignment between WTO obligations and sustainable waste management practices (Hussain et al., 2023).

National Administrative Responses and Trade Regulation

Administrative authorities serve as the operational backbone of environmental governance in the context of plastic waste trade. Their responsibility encompasses a wide range of functions—policy formulation, licensing, inspection, monitoring, enforcement, and reporting. National governments, through ministries of environment, commerce, and customs, are primarily tasked with ensuring that plastic waste imports and exports comply with both domestic environmental standards and WTO commitments (Ullah, 2024). In practice, national administrative responses to plastic waste trade vary significantly depending on institutional capacity and political will. Countries with advanced regulatory systems, such as Japan or the European Union members, have integrated their waste management strategies into comprehensive circular economy frameworks. These include strict import licensing regimes, advanced recycling standards, and producer responsibility schemes—all aligned with WTO principles of transparency and non-discrimination. Such administrative practices not only reduce environmental risks but also foster a level playing field for trade in recyclable materials (Hussain et al., 2023).

In contrast, many developing economies face persistent administrative gaps. The absence of digitalized licensing systems, inadequate waste classification procedures, and limited coordination among environmental and trade authorities often lead to regulatory inconsistencies. This results in either excessive leniency—allowing environmentally harmful imports—or excessive restrictions that may violate WTO rules (Farooq et al., 2023). For instance, when environmental authorities impose import bans without prior risk assessments or procedural transparency, these measures can be challenged as arbitrary under the GATT. Conversely, weak enforcement allows illegal or substandard waste imports, undermining environmental integrity and public health (Liu et al., 2023).

- An effective administrative pathway, therefore, requires balancing trade facilitation with environmental protection through structured regulatory processes. This involves three key

administrative mechanisms:

- Transparent Import Licensing – Establishing clear criteria for the import and export of plastic waste, consistent with WTO notification requirements (Khan & Ximei, 2022).
- Risk-Based Inspection Systems – Employing scientific risk assessments to classify waste streams and determine environmentally sound management options (Riaz et al., 2022).
- Inter-Agency Coordination Platforms – Integrating environmental, trade, and customs authorities through digital information-sharing mechanisms to enhance compliance and traceability (Amjad et al., 2022).

Countries that have adopted such measures demonstrate that administrative modernization is not only compatible with WTO law but also a prerequisite for effective environmental governance. A rules-based, transparent administrative structure strengthens the legitimacy of national environmental measures and reduces the likelihood of trade disputes. Moreover, administrative reforms that embed sustainability principles—such as extended producer responsibility (EPR) and eco-design regulations—can further operationalize WTO-consistent policies (Ullah et al., 2023). By internalizing environmental costs and promoting circular production models, administrative agencies can drive systemic change within global value chains. Such reforms represent a shift from reactive regulation to proactive environmental governance aligned with sustainable development goals (Amjad et al., 2022).

Institutional Challenges in Enforcing WTO-Consistent Plastic Waste Policies

Despite these advances, implementing WTO-consistent environmental policies faces several institutional and administrative challenges, particularly in developing countries. These challenges arise from limited institutional capacity, fragmented legal frameworks, and competing policy priorities. One of the foremost challenges is institutional fragmentation, where multiple agencies share overlapping responsibilities without clear lines of authority (Ullah et al., 2023). For instance, environmental ministries may oversee waste management, while trade ministries handle import licensing and customs enforce inspections. This multiplicity often leads to inconsistent decision-making and regulatory loopholes. Such fragmentation not only delays policy implementation but also increases the risk of non-compliance with WTO transparency and notification obligations (Khan et al., 2022).

A second major issue is the lack of administrative capacity and technical expertise. Effective enforcement of plastic waste regulations requires trained personnel capable of conducting risk assessments, monitoring transboundary shipments, and evaluating environmental impact. However, in many jurisdictions, environmental agencies operate with limited resources and outdated technology, which undermines their ability to monitor compliance effectively (Ullah et al., 2025). This incapacity contributes to weak implementation of Basel and WTO-compatible trade measures. Third, data and information asymmetry remain significant obstacles. Administrative systems often lack integrated databases to track the lifecycle of imported plastics, from entry at ports to final disposal or recycling. Without accurate data, authorities cannot evaluate whether waste imports comply with environmental standards or whether trade restrictions are proportionate and justified under WTO rules. Enhanced data transparency—through digital customs declarations, blockchain-based tracking, or public disclosure platforms—could significantly improve monitoring and accountability (Lin & Khan, 2021).

Another institutional constraint is the policy incoherence between environmental protection and trade promotion objectives. Trade ministries often prioritize economic liberalization and export competitiveness, while environmental agencies emphasize precaution and sustainability. The absence of coordination mechanisms between these policy domains can result in conflicting

measures—such as subsidies for plastic manufacturing alongside bans on plastic waste imports. Achieving WTO-consistent environmental governance requires harmonizing these objectives through national strategies that clearly articulate sustainable trade principles. Finally, judicial and quasi-judicial review mechanisms within administrative law systems play an essential role in ensuring that environmental regulations withstand both domestic and international scrutiny. Independent review bodies or administrative tribunals can provide procedural safeguards against arbitrary decision-making, ensuring that environmental measures are applied fairly and consistently. Strengthening these review mechanisms enhances both transparency and accountability—key principles of the WTO framework. Addressing these institutional challenges demands comprehensive administrative reform. Governments should adopt integrated regulatory models that consolidate environmental and trade functions under unified policy frameworks. Establishing National Environmental Trade Authorities (NETAs) could serve as a model—bodies that coordinate trade compliance, environmental licensing, and international reporting under one institutional umbrella. Additionally, embedding capacity-building programs and public–private partnerships can mobilize resources and expertise to improve enforcement capabilities (Khan, 2022).

In essence, the administrative enforcement of WTO-consistent plastic waste policies requires more than legal alignment—it necessitates a transformation of institutional culture. Administrative agencies must evolve from passive regulators into proactive governance entities capable of anticipating environmental risks, engaging stakeholders, and applying trade rules with ecological sensitivity. This integration of administrative efficiency and environmental responsibility represents the most viable pathway for achieving sustainable plastic waste trade governance under WTO law (Abdelrehim Hammad et al., 2021).

Reforming the Global Plastic Waste Regime

The governance of global plastic waste trade has reached a critical inflection point. While international instruments such as the Basel Convention, the WTO Agreements, and various regional trade frameworks provide partial regulatory coverage, their fragmented and sector-specific nature has limited their effectiveness. The current regime fails to adequately reconcile trade liberalization objectives with environmental protection imperatives, resulting in policy incoherence, uneven enforcement, and persistent environmental degradation. Reforming the global plastic waste regime, therefore, demands an integrated approach that aligns trade and environmental governance within a coordinated multilateral framework. Such reform must also reinforce administrative cooperation across borders to ensure that international commitments are operationalized through coherent national practices. The future of sustainable plastic trade governance hinges on the ability of the WTO and other international bodies to bridge the normative gap between trade facilitation and ecological responsibility. The WTO's rules, originally designed to remove trade barriers, must evolve to accommodate 21st-century environmental realities—particularly those arising from the exponential growth of plastic production and cross-border waste flows. Without structural reforms that embed sustainability principles into the global trading system, existing frameworks risk perpetuating ecological harm while undermining public trust in international trade governance (Khan & Wu, 2021).

Integrating Trade and Environmental Governance

The integration of trade and environmental governance represents the cornerstone of an effective reform agenda. Historically, the WTO has been cautious in addressing environmental issues, preferring to rely on exceptions under Article XX of the GATT. However, the environmental

implications of plastic waste trade call for a more proactive institutional stance. Integrating trade and environmental governance does not require rewriting the WTO's legal foundation but rather reinterpreting its provisions to support sustainability-oriented outcomes. A key reform direction involves the mainstreaming of environmental considerations within WTO committees and negotiations. The Committee on Trade and Environment (CTE) can be strengthened as a platform for cross-institutional coordination with UNEP and the Basel Convention Secretariat. Through regular reporting, peer review, and best practice exchange, the CTE could serve as a hub for harmonizing trade rules with environmental standards related to waste management and circular economy practices (Khan et al., 2021).

Another critical reform lies in enhancing policy coherence between trade measures and environmental treaties. The Basel Convention's amendments restricting the transboundary movement of hazardous plastic waste offer a useful starting point. However, their effectiveness depends on the ability of the WTO to recognize and support these measures as legitimate environmental objectives rather than disguised trade restrictions. This could be operationalized through interpretative declarations or dispute settlement jurisprudence affirming that environmentally justified import restrictions fall within the scope of Article XX(b) and (g) (Soomro et al., 2021).

Furthermore, sustainability-oriented trade facilitation measures could incentivize environmentally sound waste management. The WTO's Trade Facilitation Agreement (TFA) offers potential tools, such as capacity-building and transparency provisions, that could support the traceability of plastic waste shipments. Integrating environmental data reporting within trade facilitation mechanisms would enable customs and environmental authorities to better monitor waste flows while maintaining compliance with WTO obligations. Equally important is the incorporation of circular economy principles into trade regulation. This approach shifts the focus from restricting waste trade to promoting trade in recyclable materials, green technologies, and sustainable packaging. WTO members could adopt a "green classification" system that distinguishes environmentally beneficial products from harmful waste, supported by mutual recognition of standards. Such differentiation would encourage sustainable industries while discouraging environmentally damaging trade practices. Finally, reforming the dispute settlement process to allow environmental expertise and amicus curiae participation could enhance the legitimacy and environmental sensitivity of WTO adjudication. Allowing environmental agencies, NGOs, and scientific experts to contribute to trade-environment disputes would enrich the evidentiary base and strengthen the alignment between trade law and environmental objectives (Khan et al., 2021).

Recommendations for WTO and Administrative Cooperation

Beyond legal reform, effective plastic waste governance depends on robust administrative cooperation at both international and national levels. The success of any global regime rests on the operational capacity of domestic institutions to implement, monitor, and enforce environmentally sound trade measures. Therefore, reforms must focus on enhancing administrative coordination, capacity-building, and compliance mechanisms within WTO member states. At the international level, the WTO should establish a Joint Working Group on Trade and Waste Governance, co-chaired by representatives from the WTO, UNEP, and the Basel Convention. This group would oversee policy harmonization, data-sharing initiatives, and capacity-building programs for developing countries. It could also promote uniform classification standards for plastic waste and recyclable materials, reducing disputes over waste definitions and facilitating lawful trade in environmentally sound goods. To strengthen cross-border administrative cooperation, WTO members could negotiate a Plurilateral Environmental Trade Facilitation Agreement (ETFA). This

instrument would aim to standardize customs procedures for waste shipments, promote transparency in licensing, and provide technical assistance to developing countries in establishing electronic traceability systems. Such an agreement would operationalize the principle of “shared but differentiated responsibility” within the WTO framework, aligning trade facilitation with environmental integrity (Kahn & Wu, 2020).

At the national level, administrative agencies must evolve into “green regulators” capable of balancing trade objectives with environmental stewardship. This involves developing integrated information systems that link customs, trade, and environmental authorities to monitor the life cycle of plastic materials. Governments should invest in digital platforms that record and trace transboundary waste flows, supported by blockchain or artificial intelligence tools for real-time verification. Additionally, capacity-building initiatives are crucial for enabling developing countries to comply with complex WTO and environmental standards. The WTO, in collaboration with UNEP and UNCTAD, should expand its technical assistance programs to include training on environmental risk assessment, circular economy policy design, and compliance reporting. Such initiatives would enhance the administrative competence required for effective implementation and reduce disparities between developed and developing members (Gul & Ahmad, 2025).

From a regulatory perspective, domestic legal reforms should establish independent administrative review bodies to oversee environmental trade decisions. These bodies would ensure procedural fairness, transparency, and alignment with WTO principles, thereby preventing arbitrary or protectionist measures. Strengthening administrative accountability would not only improve compliance but also bolster public confidence in environmental decision-making. Finally, international cooperation in data governance must become a cornerstone of plastic waste regulation. The absence of reliable data on waste generation, trade volumes, and recycling capacity continues to hinder effective policymaking. WTO members should commit to a shared database managed jointly with the Basel Convention Secretariat, enabling real-time tracking of global waste flows. Such transparency would empower regulators, industries, and civil society to identify violations, trace illegal trade, and evaluate policy effectiveness (Gul et al., 2025).

In summary, reforming the global plastic waste regime requires a dual transformation: legal reinterpretation at the WTO level and administrative modernization within national systems. Trade and environmental governance must no longer function as parallel or competing systems but as interdependent mechanisms of global sustainability. Through integrated institutional design, enhanced cooperation, and administrative innovation, the WTO can evolve into a facilitator of ecological resilience rather than a barrier to environmental progress. The path toward sustainable plastic waste trade thus lies in bridging the divide between international trade law and environmental governance through coordinated reform, shared responsibility, and adaptive institutional capacity (Gul et al., (2025).

Conclusion

The governance of plastic waste trade represents one of the most pressing and complex challenges at the intersection of international trade and environmental protection. This study has demonstrated that while the WTO framework provides a foundational legal architecture for regulating global trade, its capacity to address environmental externalities—particularly those linked to plastic waste—remains limited without administrative and institutional reinforcement. The key argument advanced here is that effective plastic waste governance depends not only on the reform of WTO rules but also on the modernization of national administrative systems that implement and enforce those rules. From a legal standpoint, WTO provisions such as Articles XX(b) and (g) of the GATT,

along with the principles of transparency and non-discrimination, already provide a normative basis for environmentally justified trade restrictions. However, these provisions need to be interpreted in a way that actively supports sustainability objectives rather than merely tolerating them as exceptions. Greater synergy between the WTO and multilateral environmental agreements, such as the Basel Convention, could help ensure that environmental measures aimed at regulating plastic waste are recognized as legitimate within the multilateral trading system. At the administrative level, governments must build institutional capacity to operationalize these legal principles effectively. This involves developing transparent import and export licensing systems, risk-based inspection mechanisms, and inter-agency coordination platforms that align trade facilitation with environmental integrity. Administrative reforms should emphasize digitalization, data-sharing, and regulatory coherence to ensure that plastic waste trade remains both economically viable and environmentally responsible.

Looking forward, several key policy and research directions emerge from this analysis. First, there is a need for the WTO to institutionalize environmental expertise within its dispute settlement system. Incorporating technical and ecological perspectives in adjudicating trade–environment disputes would strengthen the system’s legitimacy and policy relevance. Second, regional and plurilateral initiatives—such as an Environmental Trade Facilitation Agreement—should be explored to complement global efforts, particularly in standardizing waste classification, reporting, and traceability. Third, scholars and policymakers should further investigate the role of digital governance tools, including artificial intelligence, blockchain, and big data analytics, in improving administrative efficiency and compliance monitoring in waste trade. Finally, future research should extend beyond the legal and administrative dimensions to include socioeconomic and technological perspectives, exploring how sustainable plastic management can contribute to green industrial transformation and circular economies. The alignment of trade governance with sustainable development goals (SDGs) is not merely a legal or administrative challenge—it is an ethical and global imperative. In essence, the reform of the plastic waste trade regime requires an integrated, multi-level approach that combines WTO legal evolution, national administrative innovation, and international cooperation. Only through such alignment can the global trading system become a genuine instrument of environmental stewardship and sustainable economic growth in the 21st century.

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