

# A Critical Examination of International Law Perspectives on the Legal Dimensions of Trans-Boundary Environmental Impacts

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## Abstract

*This study critically examined the international legal dimensions of trans-boundary environmental pollution, with particular attention to Nigeria's experience within the West African subregion. The article aimed to explore how pollutants originating from one state caused ecological, social, and economic harm across borders, thereby challenging the traditional notion of territorial sovereignty. Using a doctrinal research methodology, the study analyses treaties, judicial precedents, and regional conventions such as the Abidjan Convention and the Convention on Long-Range Trans-Boundary Air Pollution to assess existing legal responses. Findings reveal that while international law, through principles like the no-harm rule and state responsibility, provides a framework for prevention and cooperation, implementation remains weak due to poor institutional capacity, fragmented laws, and geopolitical interests. The study identified key challenges including inadequate monitoring, weak enforcement, and lack of corporate accountability. The work highlighted emerging global trends such as environmental human rights, climate-integrated governance, and digital monitoring as future pathways for reform. The study concluded that effective trans-boundary environmental governance requires stronger regional cooperation, legal harmonisation, technological innovation, and the institutionalisation of participatory environmental diplomacy to ensure ecological justice and sustainable development in Nigeria and beyond.*

**Keywords:** Trans-boundary Pollution, International Environmental Law, State Responsibility, Environmental Governance

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## 1.0 Introduction

Trans-boundary environmental pollution has emerged as one of the most challenging issues in international environmental governance.<sup>1</sup> When pollutants travel across borders through wind, water, or ocean currents, they render traditional notions of state sovereignty inadequate.<sup>2</sup> What was once seen as a local or national concern has now become a shared, global responsibility and Africa, with its weaker institutions, fragmented legal systems, and reliance on extractive industries, feels this shift acutely. Nigeria, in particular, finds itself at

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<sup>1</sup> CFRN 1999 (as amended) Ss 20 17 (2) (d) 4 (2) 12 (1) 33 (1).

<sup>2</sup> G Handl, 'Territorial Sovereignty and the Problem of Transnational Pollution' [1975] (69) (1) *American Journal of International Law*, 50-76

the heart of the problem: the battered ecosystems of the Niger Delta, ongoing gas flaring, and industrial emissions do not simply stop at its frontiers but ripple outward into neighbouring states and beyond.<sup>3</sup> Because environmental systems are inherently interconnected, purely domestic laws are no longer sufficient. States are increasingly bound by obligations under principles such as the no-harm rule, state responsibility, and environmental due diligence, all of which arise from the recognition that activities within one state's borders can significantly affect its neighbour.<sup>4</sup> International instruments such as the 1979 Convention on Long-Range Transboundary Air Pollution (CLRTAP) and the 1991 Espoo Convention have sought to embed these ideas into governance structures, promoting cooperation, transparency, and dispute resolution.<sup>5</sup> Yet enforcement remains weak, especially in developing regions where monitoring, attribution, and implementation suffer from resource deficits and limited political commitment.

Nigeria's experience illustrates this intricate web of challenges. From oil spills in the Niger Delta to desertification in the North, many environmental problems cross national boundaries and affect neighbouring countries such as Cameroon, Chad, and Niger. Regional frameworks like the Abidjan Convention and the African Convention on the Conservation of Nature and Natural Resources provide useful tools, but their impact is undermined by weak enforcement mechanisms and a lack of binding commitments.<sup>6</sup> Adding to the complexity is the role of multinational corporations, whose cross-border operations make liability and accountability difficult, while existing international law still lags in establishing enforceable regimes to hold them responsible.

This article analyses international-law perspectives on trans-boundary pollution in West Africa, with a special focus on Nigeria. It evaluates existing legal frameworks, the institutional and procedural gaps that limit their effectiveness, and possible strategies for strengthening cross-border environmental governance. Ultimately, it argues for governance that is more integrated, preventive, and participatory – one that can respect state sovereignty while acknowledging our shared ecological fate.

## 2.0 Overview of Trans-Boundary Environmental Pollution

Trans-boundary environmental pollution refers to the release of pollutants from one state's territory that causes environmental harm in another, either directly or indirectly<sup>7</sup>. These pollutants whether in the form of air, water, or hazardous substances often transcend national borders through natural vectors such as atmospheric currents, river systems, and oceanic flows<sup>8</sup>. The phenomenon poses a serious challenge to the traditional model of territorial sovereignty, which assumes that states bear exclusive responsibility for what occurs within

<sup>3</sup> O Bello, 'The Dynamics of Nigeria's Oil and Gas Industry's Environmental Regulation: Revealing/Storying Neglected Voices and Excluded Lives of Environmental Encounters and Affects' (Unpublished Doctoral dissertation, University of Westminster 2021).

<sup>4</sup> J B Ruhl, 'Thinking of Environmental Law as a Complex Adaptive System: How to Clean Up the Environment by Making a Mess of Environmental Law' [1997] (34) (1) *Houston Law Review*, 933.

<sup>5</sup> C Kauffmann and C Saffirio, 'Study of International Regulatory Co-operation (IRC) Arrangements for Air Quality: the Cases of the Convention on Long-Range Transboundary Air Pollution, the Canada-United States Air Quality Agreement, and Co-operation in North East Asia' [2020] (7) (2) *The Regulatory Review*, 111.

<sup>6</sup> M A Folorunso and S A Folorunso, 'Environmental Degradation in Nigeria: the Challenges of Peaceful Co-existence' in Editor (ed), *Peace Studies for Sustainable Development in Africa: Conflicts and Peace Oriented Conflict Resolution* (Cham: Springer International Publishing 2022) 207-218.

<sup>7</sup> C Redgwell, 'Transboundary Pollution: Principles, Policy and Practice' in E Louka (ed), *Transboundary Pollution* (Cheltenham, Edward Elgar Publishing, 2015) 11–35.

<sup>8</sup> D Stengel and others, 'Contaminants and Pollutants' in J Davenport and J L Davenport (eds), *The Ecology of Transportation: Managing Mobility for the Environment* (Dordrecht, Springer Netherlands, 2006) 361–389.

their jurisdiction<sup>9</sup>. In contrast, trans-boundary pollution reveals the interconnectedness of environmental systems and the limitations of domestic legal frameworks when environmental harms ignore political boundaries.

Historically, the problem became prominent in the 20th century with episodes such as the acid rain crisis in Europe and North America, caused by industrial emissions traveling hundreds of kilometres through wind and weather systems<sup>10</sup>. These events prompted recognition that pollution is not always a localised occurrence. In Africa, the degradation of the Lake Chad Basin and pollution of the River Niger both of which involve multiple riparian states underscore the scale of shared environmental threats<sup>11</sup>. Nigeria, being a source and receptor of trans-boundary pollution, is particularly affected. Gas flaring in the Niger Delta, for instance, releases greenhouse gases and particulate matter that not only affect local communities but also contribute to regional air quality decline and global climate change.<sup>12</sup>

International law has responded to this challenge through the development of principles and treaties aimed at regulating and mitigating trans-boundary environmental impacts. Chief among these principles is the no-harm rule, which obliges states to ensure that activities within their jurisdiction do not cause environmental damage to other states<sup>13</sup>. This is closely linked to the principle of state responsibility and the emerging norm of environmental due diligence, which require proactive assessment and mitigation of potential harm<sup>14</sup>. Instruments such as the 1979 Convention on Long-Range Trans-boundary Air Pollution (CLRTAP) and the Espoo Convention (1991) institutionalise these norms and promote cross-border cooperation, information-sharing, and dispute resolution<sup>15</sup>.

In practice, however, implementing these principles faces significant obstacles. First, environmental damage is often difficult to quantify, trace, and legally attribute across borders<sup>16</sup>. Second, weaker states may lack the technical capacity to monitor and report trans-boundary pollution. Third, geopolitical considerations frequently override environmental cooperation. For instance, in the Niger Delta, despite longstanding pollution, enforcement remains weak due to entrenched political and economic interests.<sup>17</sup> Moreover, legal mechanisms for holding multinational corporations accountable for cross-border harm remain underdeveloped, especially in regions where state institutions are fragile<sup>18</sup>.

The legal complexity of trans-boundary pollution lies in balancing national interests with the collective good. Sovereignty, though still a foundational norm in international law, is no

<sup>9</sup> T J Biersteker, 'State, Sovereignty and Territory' in W Carlsnaes, T Risse and B A Simmons (eds), *Handbook of International Relations* (London, SAGE Publications, 2013) 245–272.

<sup>10</sup> J McCormick, *Acid Earth: The Global Threat of Acid Pollution* (London, Routledge, 2013).

<sup>11</sup> O S Olowoyeye and others, 'Water and Food Sustainability in the Riparian Countries of Lake Chad in Africa' [2023] (15) (13) *Sustainability Journal*, 10009.

<sup>12</sup> K E Ukhurebor and others, 'Environmental Influence of Gas Flaring: Perspective from the Niger Delta Region of Nigeria' [2024] (2024) (1) *Geofluids*, 22.

<sup>13</sup> W A Dewanto and others, 'State Responsibility for Environmental Damage from Climate Change Under the No-Harm Principle' [2024] (1) (1) *Hang Tuah Law Journal*, 62–76.

<sup>14</sup> R Pisillo-Mazzeschi, 'The Due Diligence Rule and the Nature of the International Responsibility of States' [1992] (35) (1) *German Yearbook of International Law*, 9.

<sup>15</sup> M G Lewis and others, 'International Environmental Law-Making and Diplomacy Review 2013' [2014] (25) (4) *Review of European Community & International Environmental Law*, 450-480.

<sup>16</sup> M Mason, *The New Accountability: Environmental Responsibility Across Borders* (London Routledge 2012) 15.

<sup>17</sup> Z O Edo and others, 'Explaining the State of Environmental Enforcement in Nigeria's Niger Delta Region: Some Theoretical Consideration' [2024] (31) (1) *Journal of Political Studies*, 13.

<sup>18</sup> J E Stiglitz, 'Regulating Multinational Corporations: Towards Principles of Cross-Border Legal Framework in a Globalized World Balancing Rights with Responsibilities' [2007] (23) (1) *American University International Law Review*, 451.

longer absolute when ecological consequences spill over borders<sup>19</sup>. Hence, newer legal approaches emphasise shared responsibility, cooperative governance, and regional integration<sup>20</sup>. For example, the Abidjan Convention, to which Nigeria is a party, represents a regional attempt to manage marine pollution in West and Central Africa<sup>21</sup>. Similarly, Nigeria's domestic environmental laws though fragmented have begun to reflect global environmental principles through agencies such as NESREA, NOSDRA, and NIMASA, whose roles interface with international legal obligations.

As climate change accelerates, with attendant cross-border effects such as desertification, forced migration, and food insecurity, the urgency of managing trans-boundary environmental pollution through law has never been greater. What is required is not merely a patchwork of treaties, but an integrated legal and institutional architecture one that is preventive, participatory, and grounded in both environmental justice and scientific reasoning.

In essence, trans-boundary environmental pollution challenges the boundaries of state authority and the adequacy of conventional legal responses. It compels a reimagining of environmental governance where national policies are harmonised with regional and international standards, and where the environment is treated not as the property of any one state, but as a shared inheritance requiring collective stewardship.

### 3.0 Effect of Trans-Boundary Environmental Pollution

The consequences of trans-boundary environmental pollution are multifaceted, cutting across ecological, socio-economic, legal, and geopolitical spheres. Unlike localised pollution, which may be addressed through national frameworks, trans-boundary pollution creates layers of complexity because its effects often extend beyond the originating state's territory, making cooperation and coordinated response essential<sup>22</sup>. These impacts are neither abstract nor distant; they manifest tangibly in public health crises, ecosystem collapse, displacement of populations, and transnational tensions<sup>23</sup>.

One of the most immediate effects of trans-boundary pollution is environmental degradation. Pollutants released into the air or water in one country can cause acid rain, reduced air quality, and contamination of water bodies in another. In West Africa, for example, industrial discharges and crude oil spills in Nigeria's Niger Delta find their way into shared river systems, such as the River Niger, affecting aquatic life and agricultural livelihoods in Benin, Niger, and Mali.<sup>24</sup> The downstream effect includes the loss of biodiversity, soil contamination, and compromised ecosystem services. Similarly, desertification in northern Nigeria, worsened by unsustainable land use and climate-induced pressures, contributes to regional dust storms that affect Chad, Cameroon, and Niger, impacting visibility, respiratory health, and agricultural productivity across borders.

<sup>19</sup> P M Mische, 'Ecological Security and the Need to Reconceptualize Sovereignty' [1989] (14) (4) *Alternatives Journal*, 389–427.

<sup>20</sup> *Ibid.*

<sup>21</sup> D M Dzidzornu, 'Marine Pollution Control in the West and Central African Region' [1994] (20) (1) *Queen's Law Journal*, 439.

<sup>22</sup> C Redgwell, 'Transboundary Pollution: Principles, Policy and Practice' in C Redgwell (ed), *Transboundary Pollution* (Cheltenham, Edward Elgar Publishing, 2015), 11–35.

<sup>23</sup> A Briggs, 'Climate Change, Conflict, and Contagion: Emerging Threats to Global Public Health' in N Mora (ed), *Healthcare Access: New Threats, New Approaches* (London, IntechOpen, 2023) 124.

<sup>24</sup> C N P Okonkwo and others, 'The Niger Delta Wetland Ecosystem: What Threatens It and Why Should We Protect It?' [2015] (9) (5) *African Journal of Environmental Science and Technology*, 451–463.

Another significant impact is on public health. Exposure to polluted air and contaminated water supplies increases the incidence of respiratory diseases, waterborne infections, and long-term conditions like cancer and cardiovascular disorders. In many West African countries, including Nigeria, insufficient access to clean water has been aggravated by the cross-border spread of industrial waste and agricultural runoff containing hazardous chemicals. Moreover, open gas flaring in the Niger Delta contributes not only to local pollution but also to regional atmospheric degradation, increasing vulnerability to climate-sensitive diseases such as malaria and heatstroke<sup>25</sup>.

Economic consequences are also considerable. Pollution that damages cross-border ecosystems often leads to the collapse of shared economic activities, particularly in the agriculture and fisheries sectors. Communities dependent on the Lake Chad Basin shared by Nigeria, Chad, Cameroon, and Niger have experienced a dramatic decline in fish stocks and arable land, largely due to both climate change and upstream pollution<sup>26</sup>. The cumulative loss of livelihoods has spurred mass migration and intensified socio-economic instability in already fragile regions<sup>27</sup>. Moreover, the cost of remediation, public health interventions, and lost productivity places an overwhelming financial burden on affected states, many of which lack adequate fiscal space for environmental recovery<sup>28</sup>.

At the legal and diplomatic level, trans-boundary pollution frequently becomes a source of international tension. Where harm is traceable, affected countries may seek redress through diplomatic channels, regional forums, or international adjudicatory mechanisms. However, challenges in establishing liability, proving causation, and enforcing judgments often frustrate the process<sup>29</sup>. In Africa, where legal and technical infrastructure remains underdeveloped, such claims are rare and frequently unresolved. This undermines trust among states and weakens the credibility of international environmental law. It also reveals a structural imbalance, where powerful transnational corporations, often responsible for major pollution, escape liability while host states struggle to hold them accountable across jurisdictions.

There are also political and security implications. The environmental stress caused by pollution-induced resource scarcity often contributes to conflict. In regions like the Sahel, competition over shrinking water bodies and grazing lands, exacerbated by cross-border environmental impacts, has inflamed ethnic tensions and fueled insurgencies. In the Niger Delta, persistent pollution has deepened local grievances, contributing to restiveness and vandalism of oil infrastructure phenomena with cross-border ripple effects due to the regional nature of the oil trade and security concerns.<sup>30</sup>

In summary, the effects of trans-boundary environmental pollution are far-reaching and deeply interwoven with broader issues of human welfare, regional stability, and international cooperation. Nigeria, as both a source and victim of such pollution, stands at a critical juncture. Addressing these impacts requires not only strengthened national enforcement

<sup>25</sup> S U Ighedosa and others, 'Climate Change: Vulnerability of the Niger Delta Region, in Nigeria' [2019] (1) (2) *Generations Journal*, 4–5.

<sup>26</sup> S B Owonikoko and others, 'Environmental Degradation, Livelihood, and the Stability of Chad Basin Region' [2020] (31) (6) *Small Wars & Insurgencies*, 1295–1322.

<sup>27</sup> AA Osman and others, 'Rural Displacement and Its Implications on Livelihoods and Food Insecurity: The Case of Inter-Riverine Communities in Somalia' [2023] (13) (7) *Agriculture*, 1444.

<sup>28</sup> A Lazurko and others, *Financing Resource Recovery and Reuse in Developing and Emerging Economies: Enabling Environment, Financing Sources and Cost Recovery* (Colombo, International Water Management Institute 2018) 23–28.

<sup>29</sup> M S Moore and others, 'Causation and Responsibility' [1999] (16) (2) *Social Philosophy and Policy*, 1–51.

<sup>30</sup> P S Orogun, 'Resource Control, Revenue Allocation and Petroleum Politics in Nigeria: The Niger Delta Question' [2010] (75) (5) *GeoJournal*, 459–507.

mechanisms but also genuine regional solidarity, technical collaboration, and legal frameworks that can hold both state and non-state actors accountable beyond borders<sup>31</sup>.

#### 4.0 Challenges Faced Addressing the Problem of Trans-Boundary Environmental Pollution

The legal and institutional management of trans-boundary environmental pollution is fraught with significant challenges. These hurdles stem not only from the nature of environmental harm often diffuse, technical, and transnational but also from political inertia, legal fragmentation, and economic asymmetries. For countries like Nigeria and its West African neighbours, the complexities of addressing such pollution are further compounded by weak governance systems, under-resourced regulatory institutions, and limited access to environmental data.

One fundamental challenge is the difficulty of attribution and enforcement. Environmental pollution that crosses borders is not always easily traceable to a single source or actor.<sup>32</sup> For instance, airborne pollutants released from industrial zones can travel across countries within days, making it scientifically complex and legally burdensome to identify the precise origin. Even where sources are identifiable, enforcement is often stifled by a lack of clear jurisdiction or the unwillingness of polluting states or entities to accept liability. Unlike traditional legal disputes, trans-boundary environmental claims often lack compelling precedent or robust enforcement mechanisms at the international level.<sup>33</sup> The Trail Smelter Arbitration (1938–1941) may stand as a landmark case in international law, but replicating such outcomes in present-day Africa remains elusive.

Another major obstacle lies in legal fragmentation and overlapping mandates. In many regions, including West Africa, environmental governance is scattered across multiple laws, agencies, and international agreements that do not always speak to one another. For instance, Nigeria operates under several statutes such as the NESREA Act, NOSDRA Act, and Mineral and Mining Act each addressing different aspects of pollution without an integrated legal framework. This disjointedness often results in duplication, institutional rivalry, or regulatory gaps, making coherent enforcement of environmental standards extremely difficult<sup>34</sup>. At the regional level, while instruments like the Abidjan Convention and African Convention on the Conservation of Nature and Natural Resources exist, they often lack binding force or are undermined by weak implementation<sup>35</sup>.

Technical capacity and data limitations present yet another challenge. Accurate environmental monitoring, pollution modelling, and trans-boundary impact assessments require advanced technology, trained personnel, and sustained funding resources that many developing countries struggle to maintain. The absence of reliable data means affected states

<sup>31</sup> D Armstrong and others (eds), *Civil Society and International Governance: The Role of Non-State Actors in Global and Regional Regulatory Frameworks* (London, Routledge, 2010) 67.

<sup>32</sup> M Mason, *The New Accountability: Environmental Responsibility Across Borders* (London, Routledge, 2012) 23.

<sup>33</sup> A L Springer, *Cases of Conflict: Transboundary Disputes and the Development of International Environmental Law* (Toronto, University of Toronto Press, 2016) 34.

<sup>34</sup> E P Weber, *Pluralism by the Rules: Conflict and Cooperation in Environmental Regulation* (Washington D C, Georgetown University Press, 1998) 35.

<sup>35</sup> H Barnes-Dabban and S Karlsson-Vinkhuyzen, 'The Influence of the Regional Coordinating Unit of the Abidjan Convention: Implementing Multilateral Environmental Agreements to Prevent Shipping Pollution in West and Central Africa', [2018] (18) (4) *International Environmental Agreements: Politics, Law and Economics*, 469-489.

cannot quantify damage or negotiate equitable remedies<sup>36</sup>. In the Lake Chad region, for instance, decades of pollution, drought, and unsustainable usage have created an ecological crisis. Yet, cooperative planning remains hindered by inconsistent reporting and the absence of a centralised, region-wide data repository.

Political will and economic interests also constrain environmental enforcement. States with strong economic dependence on extractive industries, such as oil and gas, may be reluctant to regulate corporate actors or impose strict pollution controls for fear of losing foreign investment<sup>37</sup>. Multinational corporations operating in environmentally sensitive regions often exploit legal loopholes, weak oversight, or the lack of trans-boundary liability regimes to avoid responsibility. In Nigeria's Niger Delta, despite overwhelming evidence of pollution, enforcement actions remain sporadic and often politically influenced<sup>38</sup>.

Furthermore, there exists a deficit in public participation and environmental awareness. Trans-boundary pollution disproportionately affects rural and marginalised communities that often lack access to legal representation or formal grievance mechanisms. Public access to information, environmental education, and civic engagement remain limited, thereby weakening community-level advocacy and accountability. International law, while increasingly supportive of participatory norms, still struggles to empower communities in the global South who face the most direct environmental harms<sup>39</sup>.

Finally, diplomatic sensitivity and regional politics can hinder cross-border cooperation. States may resist sharing environmental data or jointly acknowledging damage due to fears of reputational harm or diplomatic fallout.<sup>40</sup> This is particularly evident in contexts where historical tensions, border disputes, or competing economic interests already exist<sup>41</sup>. In such cases, environmental concerns become secondary to political strategy.

In sum, addressing trans-boundary environmental pollution is not solely a legal exercise it is also a deeply political and institutional one. To overcome these barriers, there must be a concerted effort to strengthen legal coherence, build technical and institutional capacity, enhance accountability mechanisms, and foster a cooperative regional culture where environmental integrity is prioritised above short-term gains.

## 5.0 Strategies for Effective Trans-Boundary Environmental Pollution Management and Governance

Effectively managing trans-boundary environmental pollution requires a combination of legal, institutional, technical, and diplomatic strategies. Since pollution respects no borders, isolated national efforts often prove insufficient. Rather, cooperative, rule-based, and science-informed approaches are essential<sup>42</sup>. For a country like Nigeria positioned at the heart of several ecologically sensitive and politically volatile subregions strategic engagement at both

<sup>36</sup> L Kaplow and others, 'Accuracy in the Ass-essment of Damages' [1996] (39) (1) *The Journal of Law and Economics*, 191–210.

<sup>37</sup> E Canel and others, 'Rethinking Extractive Industry: Regulation, Dispossession, and Emerging Claims' [2010] (30) (1–2) *Canadian Journal of Development Studies/Revue canadienne d'études du développement*, 5–25.

<sup>38</sup> E O Nwaichi and others, 'Has the National Policy on Environmental Pollution Control in Nigeria Been Neglected in the Niger Delta Region? An Update' [2022] (24) (11) *Environment, Development and Sustainability*, 12494–12517.

<sup>39</sup> C G Gonzalez, 'Environmental Justice, Human Rights, and the Global South' [2015] (13) (1) *Santa Clara Journal of International Law*, 151.

<sup>40</sup> J E Carroll (ed), *International Environmental Diplomacy* (Cambridge, CUP Archive, 1988).

<sup>41</sup> K A Schultz, 'Borders, Conflict, and Trade' [2015] (18) (1) *Annual Review of Political Science*, 125–145.

<sup>42</sup> K M Smith and others, 'Addressing Complex Challenges in Coupled Natural and Human Systems Through Principled Pragmatism: A Case Study from Bangladesh' [2021] (3) (1) *Frontiers in Water*, 617255.

domestic and international levels is critical to curbing the cross-border flow of pollutants and fostering environmental stability.<sup>43</sup>

One of the foundational strategies is the adoption of legally binding regional and bilateral agreements tailored to specific trans-boundary threats. While several broad multilateral environmental agreements (MEAs) exist, such as the Convention on Long-Range Trans-boundary Air Pollution (CLRTAP) or the Espoo Convention, more context-specific legal instruments are required in regions like West Africa. For example, reinforcing the Abidjan Convention through supplementary protocols and enforcement mechanisms can help member states, including Nigeria, directly address marine and coastal pollution along the Gulf of Guinea.<sup>44</sup> Likewise, establishing bilateral environmental treaties between Nigeria and neighbouring states (such as Niger, Cameroon, and Chad) concerning shared water resources like Lake Chad and the Benue River Basin could streamline joint monitoring, data sharing, and remediation responsibilities.<sup>45</sup>

Another vital approach lies in institutional harmonisation and capacity-building. Fragmented institutional mandates weaken enforcement and create regulatory blind spots. Establishing inter-agency task forces that consolidate the roles of NESREA, NOSDRA, NIMASA, and the Federal Ministry of Environment under a unified environmental coordination body would improve internal coherence. At the regional level, Nigeria can lead or co-facilitate the formation of a West African Environmental Compliance Council, under ECOWAS, to synchronise environmental impact assessment (EIA) requirements, reporting standards, and pollution response strategies across borders.

Environmental diplomacy is also a powerful yet underutilised tool. Nigeria should prioritise environmental concerns in its foreign policy agenda, treating pollution and ecological degradation as transnational security issues. Active participation in platforms like the African Ministerial Conference on the Environment (AMCEN) and stronger engagement with UNEP and UNFCCC mechanisms can amplify Nigeria's voice in shaping international norms. Diplomacy must also involve preventive negotiation and dispute avoidance, especially in pollution-prone corridors<sup>46</sup>. For example, creating standing consultative bodies for trans-boundary river management could preemptively resolve disputes over water quality or industrial runoff.

Technology-driven environmental monitoring and early-warning systems are crucial to building credible enforcement mechanisms. Satellite data, sensor networks, and mobile reporting tools can track cross-border pollution patterns in real-time. Nigeria should invest in these systems and share information with its neighbours through open data platforms, possibly under the coordination of the Lake Chad Basin Commission or similar regional bodies. Accurate, transparent data is indispensable for early intervention, liability attribution, and international cooperation.

To complement these efforts, there must be a concerted push to mainstream environmental education, public awareness, and community participation. Pollution is not only a government issue it is a societal concern. In border communities affected by industrial waste,

<sup>43</sup> S F James, 'Assessment of the Effects of Border Management on National Security in Nigeria (2013–2023)' (Unpublished Ph.D. Thesis, Department of International Relations and Diplomacy, Faculty of Management and Social Sciences, Baze University 2024) 45-180.

<sup>44</sup> J Abe and others, 'Towards a Guinea Current Large Marine Ecosystem Commission' [2020] (36) (1) *Environmental Development*, 90.

<sup>45</sup> F M OnanaIbogo, 'A Framework for the Sustainable Management of Water Resources in Lake Chad' (Unpublished Ph.D. Thesis, Technische Universität Wien 2023) 76-109.

<sup>46</sup> C T Cosgrove, *The NAAEC After Ten Years: A Qualitative Assessment of the North American Agreement on Environmental Cooperation*, <<https://scholarworks.umd.edu/etd/8629/>> accessed 17 August 2025.

oil spills, or air pollution, equipping citizens with environmental knowledge, legal awareness, and access to grievance mechanisms can help create bottom-up accountability<sup>47</sup>. Civil society organisations and indigenous groups must be involved in the design and monitoring of trans-boundary environmental agreements. Their local knowledge and lived experience often provide insights that formal institutions overlook.

The private sector, particularly multinational corporations operating in extractive and manufacturing industries, must also be held to higher environmental standards. Nigeria should insist on cross-border corporate accountability frameworks, requiring companies to disclose potential trans-boundary environmental impacts during project planning stages. Legislative reform can impose joint liability on parent companies and local subsidiaries for environmental harm, regardless of national boundaries<sup>48</sup>. This would reduce legal evasion and strengthen environmental justice.

Lastly, financial mechanisms are key to sustaining these strategies. Nigeria and its neighbours should actively tap into international environmental funds such as the Green Climate Fund (GCF), Global Environment Facility (GEF), and Adaptation Fund to finance trans-boundary pollution mitigation efforts. Regional resource pooling under ECOWAS or the African Union could also support the creation of an Environmental Contingency Fund for responding to large-scale pollution events<sup>49</sup>.

Ultimately, the complexity of trans-boundary environmental pollution demands an equally multidimensional response one that integrates legal precision, institutional coordination, scientific innovation, regional diplomacy, and civic empowerment<sup>50</sup>. Nigeria, as both a regional power and an environmental hotspot, is well-positioned to pioneer these strategies, aligning its national interest with the broader goal of environmental sustainability across West and Central Africa.

## 6.0 Future Directions and Emerging Trends in International Law on Trans-Boundary Environmental Governance

As environmental challenges grow increasingly complex and interconnected, international law on trans-boundary environmental governance is evolving in both scope and substance.<sup>51</sup> Traditional frameworks built around state responsibility and reactive regulation are gradually giving way to more proactive, cooperative, and holistic legal instruments. This shift reflects a broader recognition that environmental harm, especially across borders, cannot be managed in isolation or through fragmented treaties alone<sup>52</sup>. The future of trans-boundary environmental law will hinge on a few key trends and directions that promise to reshape the legal landscape.

One of the most significant emerging trends is the rise of environmental human rights in international discourse. Courts and treaty bodies are increasingly recognising the right to a

<sup>47</sup>D M Liverman and others, 'Environmental Issues along the United States-Mexico Border: Drivers of Change and Responses of Citizens and Institutions' [1999] (24) (1) *Annual Review of Energy and the Environment*, 607–643.

<sup>48</sup>M Anderson, 'Transnational Corporations and Environmental Damage: Is Tort Law the Answer' [2001] (41) (1) *Washburn Law Journal*, 399.

<sup>49</sup>C N Ukwé and others, 'A Regional Collaborative Approach in Transboundary Pollution Management in the Guinea Current Region of Western Africa' [2010] (53) (9) *Ocean & Coastal Management*, 493–506.

<sup>50</sup>A Adegbite, 'Cultural Dimensions in Addressing Transboundary Pollution: South African and Nigerian Perspectives' [2025] (16) (1) *Beijing Law Review*, 591.

<sup>51</sup>L J Kotzé, *Global Environmental Governance: Law and Regulation for the 21st Century* (Cheltenham, Edward Elgar Publishing 2012) 25.

<sup>52</sup>K N Scott, 'International Environmental Governance: Managing Fragmentation through Institutional Connection' [2011] (12) (1) *Melbourne Journal of International Law*, 177.

clean, healthy, and sustainable environment as a legally enforceable entitlement. This development is crucial in holding both states and corporations accountable for pollution that causes cross-border harm and violates fundamental human rights. For Nigeria and other African countries, this signals a path forward for communities affected by oil spills, air pollution, and toxic waste to seek legal remedies beyond traditional environmental regulations. Another future direction is the integration of climate change law into trans-boundary environmental governance. The effects of climate change rising temperatures, changing rainfall patterns, desertification, and sea-level rise are inherently trans-boundary in nature. International law is beginning to reflect this reality by embedding climate mitigation and adaptation obligations within broader environmental agreements. Instruments such as the Paris Agreement now require not only national efforts but also coordinated regional action<sup>53</sup>. Nigeria's national climate strategies must, therefore, be aligned with regional resilience frameworks to effectively address the spillover effects of climate-induced environmental stress. Digital innovation and environmental monitoring technologies are also reshaping legal enforcement across borders. With tools like satellite imagery, geospatial data, and remote sensors, governments and civil society actors can now track pollution in real time, trace its source, and document its impacts with legal precision. This evidentiary capacity is strengthening accountability mechanisms and may soon lead to the rise of data-driven environmental litigation, even in cases involving trans-boundary harm<sup>54</sup>.

Another notable shift is the increasing role of regional legal bodies and courts in shaping environmental jurisprudence. In Africa, institutions such as the African Court on Human and Peoples' Rights and regional economic communities like ECOWAS are gradually asserting their authority in environmental matters. These bodies could play a pivotal role in resolving cross-border disputes and ensuring that shared resources are governed equitably.

Finally, the trend toward inclusive governance and participatory lawmaking is likely to intensify. International environmental law is no longer the sole domain of states<sup>55</sup>. Non-state actors including indigenous communities, environmental NGOs, and research institutions are becoming co-creators of legal norms through consultation processes, litigation, and soft law contributions. Their continued inclusion will be vital in shaping equitable and responsive trans-boundary environmental regimes.

In sum, the future of trans-boundary environmental law lies in greater integration, innovation, and inclusiveness. For Nigeria and the broader region, embracing these shifts offers a unique opportunity to build a more just, responsive, and future-ready environmental legal framework.

## 7.0 Conclusion

In conclusion, this article underscores the urgent need for strengthened institutional capacity, transparent governance, and effective policy implementation to address the underlying challenges confronting Nigeria's developmental and environmental systems. The analysis reveals that weak enforcement mechanisms, fragmented institutional roles, and inadequate public participation have continually hindered progress despite the existence of robust legal

<sup>53</sup>D Michel and others, 'Climate Change and (In) Security in Transboundary River Basins' in E G T Saroop and M MSaroor (eds), *Handbook of Security and the Environment* (Cheltenham, UK; Edward Elgar Publishing, 2021) 62–75.

<sup>54</sup>H J D S De Queiroz, 'Navigating Legal Barriers in Climate and Environmental Technologies' in Editor Name (ed), *Navigating Law and Policy in STM Enterprises: Ethical Governance, Regulation, and Innovation Strategy* (City, IGI Global Scientific Publishing, 2025), 225–260.

<sup>55</sup>K Raustiala, 'The Participatory Revolution in International Environmental Law' [1997] (21) (1) *Harvard Environmental Law Review*, 537.

frameworks. To move forward, Nigeria must foster stronger collaboration among stakeholders, prioritize environmental accountability, and ensure that laws and policies are not only enacted but fully operational. Equally, there is a pressing need for consistent funding, improved technological adoption, and a people-centered governance approach that integrates local communities into decision-making processes. Sustainable growth and environmental stability can only be achieved when legal, institutional, and societal efforts align toward a unified goal of national advancement and ecological protection. The time for decisive and integrated action is now.

## **8.0 Recommendations**

Considering the multifaceted challenges revealed in this study, it becomes crucial to propose actionable recommendations that can strengthen institutional effectiveness, enhance policy implementation, and promote sustainable outcomes across the identified problem areas for better governance and environmental management in Nigeria.

- i. Strengthen regulatory frameworks to ensure stricter enforcement and compliance with existing environmental and institutional laws.
- ii. Enhance inter-agency collaboration through information sharing, joint operations, and periodic policy reviews for coordinated implementation.
- iii. Invest in capacity building and modern technology to improve monitoring, research, and response efficiency.
- iv. Encourage public participation and community sensitization to foster accountability and inclusive decision-making processes.