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ENVIRONMENTAL GOVERNANCE AND POLLUTION-RELATED HEALTH RISKS IN NIGERIA'S CORE NIGER DELTA: EVIDENCE FROM BAYELSA, RIVERS AND DELTA STATES

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Introduction

The Core Niger Delta, Bayelsa, Rivers, and Delta States are central to Nigeria's oil and gas industry and have generated substantial national wealth, yet their communities bear disproportionate environmental and health costs (Oyintonyo *et al.,* 2026; Abiye *et al.,* 2026; Tomquin *et al.,* 2026). Decades of exploration, production, refining, and transportation have contributed to air, water, and land pollution through gas flaring, oil spills, effluent discharge, and industrial waste (Raimi *et al.,* 2022b; 2022d; Ibimilua *et al.,* 2026). These impacts have degraded rivers, mangroves, and soils, undermining fishing and farming livelihoods and worsening public health outcomes (Ndu *et al.,* 2026). Although Nigeria has environmental frameworks, including the NESREA Act, the Environmental Impact Assessment Act, and the NDDC mandate, enforcement is weak and inconsistent. Affected communities often lack environmental information, meaningful participation in decision-making, and effective access to redress. Governance is further weakened by economic interests, limited institutional capacity, overlapping agency mandates, and distrust between communities, government, and industry. While existing studies document the environmental impacts of oil and gas activities, few examine the governance vulnerabilities that allow them to persist. This study addresses that gap by analysing environmental governance vulnerabilities in the Core Niger Delta, focusing on air, water, and land pollution and their public-health implications. Its findings offer lessons for other extractive-industry contexts in

Sub-Saharan Africa and beyond. This study examined environmental governance vulnerabilities in the Core Niger Delta oil and gas industry, focusing on institutional, regulatory, and participatory weaknesses that allow air, water, and land pollution to persist and endanger public health. Specifically, it aimed to: (i) Identify the major sources and patterns of oil and gas-related pollution in Bayelsa, Rivers, and Delta States; (ii) Examine governance factors, including oversight capacity, enforcement, transparency, inter-agency coordination, and community participation, that contribute to governance failures. (iii) Assess the effects of pollution on community health and livelihoods, particularly respiratory and waterborne illnesses and the loss of traditional livelihoods. (iv) Recommend evidence-based measures to strengthen environmental governance and protect ecosystem sustainability and public health.

Methodology

This study used a qualitative descriptive design with thematic analysis to examine environmental governance vulnerabilities in the Core Niger Delta oil and gas industry. It was conducted in Bayelsa, Rivers, and Delta States, where petroleum activities create intense environmental pressures. Data were collected through in-depth interviews with environmental agency officials, oil and gas company representatives, community leaders, NGOs, and health workers; field observations in communities affected by gas flaring, oil spills, and effluent discharge; and analysis of policies, environmental reports, regulatory frameworks, media coverage, EIAs, and remediation plans. Data were analysed through reduction, categorisation, presentation, and conclusion drawing. NVivo supported coding, theme identification, relationship mapping, and visualisation, while Excel and Word aided tabulation, analytical matrices, and document management. The analysis focused on governance weaknesses: weak oversight, inconsistent enforcement, limited transparency, poor coordination, and low public participation, and their links to environmental and health outcomes. Ethical approval was obtained, informed consent was secured, and participant data were anonymised.

Results

The study revealed significant environmental degradation and governance weaknesses in the Core Niger Delta oil and gas industry, with industrial interests often taking precedence over environmental protection. Air pollution, water contamination, land degradation and industrial waste accumulation were identified as major environmental impacts. Gas flaring and operational emissions were major sources of particulate matter (PM_{10}), sulphur dioxide (SO_2), nitrogen oxides (NO_x) and heavy metals. Communities in Bayelsa, Rivers and Delta States reported respiratory illnesses, including coughing, asthma and shortness of breath, as well as skin irritation. Correlation analysis indicated very strong positive relationships ($r = 0.99$-1.00) between measured pollutants and reported health outcomes, suggesting substantial associations between environmental pollution and public health concerns. Water pollution was another major consequence of oil and gas operations, driven by oil spills, industrial effluents, and produced water discharge into rivers, creeks, groundwater, and coastal ecosystems. Community accounts frequently highlighted heavy-metal contamination, fish mortality, skin diseases and gastrointestinal disorders. These impacts contributed to declining fish populations, reduced agricultural productivity and limited access to clean water. The NVivo thematic network further demonstrated the interconnectedness of water pollution, industrial and mining waste, weak regulatory oversight, and ecosystem damage. Land degradation and deforestation were also associated with infrastructure development, inadequate remediation of oil spill sites and hazardous waste accumulation, resulting in soil degradation, vegetation loss and disrupted agricultural and fishing livelihoods. The findings further linked environmental degradation to persistent governance deficiencies, particularly poor law enforcement, weak institutional oversight, limited transparency, inadequate coordination, and insufficient public participation. Despite existing frameworks, including the NESREA Act, EIA Act and NOSDRA regulations, implementation remains inconsistent, with inadequate sanctions and limited institutional capacity undermining compliance. Overlapping responsibilities among federal, state and local authorities, including NESREA, NOSDRA and the Department of Petroleum

Resources (DPR), further create regulatory gaps. Limited community access to environmental information and participation in monitoring, spill response, and remediation processes reinforces the imbalance between government, corporate, and community interests, allowing industrial priorities to dominate environmental decision-making.

Conclusion

This study shows that environmental governance in the Core Niger Delta oil and gas industry remains vulnerable because industrial expansion has outpaced the capacity of institutions to manage environmental risks. Although the sector contributes substantially to national revenue, employment, and infrastructure, it has also caused severe environmental degradation that threatens ecosystems, public health, and livelihoods. The findings indicate that pollution is not isolated but stems from weak regulation, limited oversight, and the prioritisation of industrial interests over environmental protection. Addressing these vulnerabilities requires stronger enforcement, improved institutional coordination, greater public participation, and transparent environmental monitoring. Without such reforms, environmental degradation and health risks will continue to intensify, undermining the long-term sustainability of the Niger Delta and the well-being of its communities.

References

Abiye, T., Tano, D. A., & Raimi, M. O. (2026). *Extractive economies, invisible burdens: Reframing environmental degradation in the Niger Delta as a public health emergency*. Preprints. https://doi.org/10.20944/preprints202602.1686.v1

Ibimilua, F. O., Raimi, M. O., & Omidiji, A. O. (2026). *Gender-just water security and biodiversity governance in Nigeria: Integrating Indigenous knowledge, WaSH systems, and women's environmental stewardship for sustainable development*. JMIR Preprints. https://doi.org/10.2196/preprints.106669

Ndu, I. F., Jack, F. N., & Raimi, M. O. (2026). *Unseen threats in our water: Assessing bacterial contamination in institutional tap water and vended water (Meruwa) in Otuogidi-Ogbia and Ogbia Main Town, Bayelsa State, Nigeria*. Preprints. https://doi.org/10.20944/preprints202603.2335.v1

Oyintonyo, M.-O., Uzobo, E., Baratuaipre, R. J., et al. (2026, August 27). *Environmental exposure to crude oil pollution is associated with under-five morbidity and mortality in Nigeria's Niger Delta* [Preprint]. Research Square. https://doi.org/10.21203/rs.3.rs-10157384/v1

Raimi, M. O., Austin-Asomeji, I., Sawyerr, H. O., Saliu, A. O., Williams-Ebuete, A., Emberru, R. E., Nimisingha, D. S., & Osungbemiro, W. B. (2022b). Leaving no one behind: Impact of soil pollution on biodiversity in the Global South: A global call for action. In S. Chibueze Izah (Ed.), *Biodiversity in Africa: Potentials, threats and conservation* (Sustainable Development and Biodiversity, Vol. 29). Springer. https://doi.org/10.1007/978-981-19-3326-4_8

Raimi, M. O., Sawyerr, H. O., Ezekwe, I. C., & Gabriel, S. (2022d). Toxicants in water: Hydrochemical appraisal of toxic metals concentration and seasonal variation in drinking water quality in oil and gas field area of Rivers State, Nigeria. In P. H. Saleh & P. A. I. Hassan (Eds.), *Heavy metals—New insights* [Working title]. IntechOpen. https://doi.org/10.5772/intechopen.102656

Tomquin, A., Ojile, M. O., Tano, D. A., & Raimi, M. O. (2026). The hidden crisis: How oil extraction in the Niger Delta is fueling a public health emergency. *Open Journal of Yangtze Oil and Gas, 11*(2), 1–53. https://www.scirp.org/journal/ojogas