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# Wetlands Crisis in Developing Regions: Causes, Consequences and Way forward -The Case of Bayelsa State

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**Abstract**

Wetlands are one the richest, most productive and important ecosystems in the world, providing a diverse range of services vital to the survival and well-being of mankind. However, wetlands are disappearing rapidly raising concerns for the health and safety of man and the planet at large. Bayelsa State wetlands are crucial ecosystems that have been exploited over the decades, playing enormous roles to communities and in the development of the state. They support high biological diversity including endangered species, and are essential for ecosystem services, livelihoods, carbon sequestration, water recharge, flood and erosion control; but they are currently vulnerable to loss and degradation mainly due to factors like rapid and uncoordinated urbanization, oil and gas related pollution, agriculture, invasive species, industrialization, nonexistent legislations, policies or frameworks, lack of interest etc. The implications of the degradation and loss of wetlands are quite substantial and catastrophic, as experienced in Bayelsa State recently; including increased and devastating flooding, increased coastal erosion and landslides, and disease (cholera) outbreaks etc. Consideration should be given to the implementation of wise use concept of wetlands, incorporation of wetland protection into urban and rural development plans, and wetland restoration initiatives. Also needed are further concern and collaborations from academicians, policy makers, development experts and stakeholders; enactment and implementation of state frameworks and laws, as well as trainings to produce expertise on wetlands management to ensure the survival of the wetland resources, humans and the planet.

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## Introduction

Wetland ecosystems are among the richest, most productive and important in the world, providing a diverse range of ecosystem services vital to human well-being (Portier, 2021). From the mid-20th century, there is increased recognition of the significance of wetlands; by the establishment of a framework for the preservation and sustainable use of wetlands (Ramsar Convention Secretariat, 2016).They play crucial roles in achieving 6 of the SDGs: SDG 1 (No poverty), SDG 2 (Zero Hunger), SDG 6 (Clean water and sanitation), SDG 12 (Responsible consumption and production), SDG 13 (Climate Action) and SDG 15 (Life on land). Wetlands are areas where water covers the soil, natural or artificial, permanent or temporary, static or following with depth that does not exceed 6m at low tide (Ramsar Convention Secretariat - RCS, 2016). Wetlands are transitional areas between terrestrial and aquatic ecosystems and they include bog, marsh or swamp; and are characterized by low drainage quality, slow or static water filled with soil and plants (Elegbede *et al*., 2014).

Wetlands play significant roles in water resource management, biodiversity and supporting livelihoods of about 1 billion people on Earth (Portier, 2021, Yu *et al*., 2023). They are rich in nutrients and minerals, and pay various roes including water purification, carbon recycling, habitat provision, flood protection etc.

The alarming rate of environmental pollution, degradation, contamination as well as the devastating effects of global warming and climate change underscores the urgent need for the protection of wetlands (RCS, 2016). Especially, as wetland protection is critical in achieving SDG 15 (Protection of life on land) and post-2020 Global Biodiversity Framework of the Convention of Biodiversity for the benefit of mankind and the Planet.

Globally, wetlands are changing rapidly, about 90% are being degraded or lost (Global Wetland Outlook, 2018); raising concern for wetlands' health and the communities relying upon its ecosystem services. Wetlands are disappearing faster than the forests; however, their loss is less known (Portier, 2021). Wetlands loss is increasing the livelihood crisis, water crisis and climate change crisis globally, but their effects are more felt in developing regions especially

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in Sub Saharan Africa that lack resources for ameliorate or mitigation of the impact f the crises.

This is particularly so for Bayelsa State that lies in the heart of the Niger Delta, one of the richest but the most exploited and vulnerable wetlands in the world (NDMP, 2005, BSOEC, 2023). Whereas, Bayelsa State known for its unique riverine and estuarine landscape is a repository of biodiversity and a high conservation priority hotspot supporting endemic and endangered species; due to its geographical location and resources it is inundated with resources exploitation and bears significant proportion of the Niger Delta oil and gas related pollution (BSOEC, 2023). Consequently, the state's ecosystems are intensely fragile facing persistent and alarming degradation and decline; losing large portions of protected and unprotected areas with severe and overreaching impacts that go beyond the valuable resources.

Bayelsa State has diverse and extensive wetlands comprising mangrove swamps, freshwater swamps, freshwater lowland swamp forests, tidal creeks, marshes and oxbow lake that are rich ecologically and economically in flora and fauna; and is crucial for Nigeria's revenue (BSOEC, 2023; Jonah *et al*, 2023). Some wetlands in Bayelsa State include Apoi Creek Forests, Taylor Creek Forest, Mangrove and fresh water swamps in Nembe areas, Akassa coastal wetlands, Igbedi Creek Forest, Ikibiri Creek Forest, Yenagoa Oxbow Lake, and the wetlands in the Asamabiri and Kalama areas where several IUCN Red List species occur (Deguignet *et al*., 2014).

The wetlands in Bayelsa State are crucial ecosystems that have been exploited over the decades and play enormous roles to communities and in the development of the state (Odubo *et al*. 2023). Their importance includes flood and erosion control, water purification, sediment trapping and protection, hydrological recharge of groundwater, water recycling, nursery and habitat protection, atmosphere cooling, food provision, wood provision, farming, income generation etc. Human settlements also concentrate in wetland areas, and they are the basis of popular FADAMA projects, which were designed to increase the incomes of rural people using land and water resources on a sustainable basis. They support high biological diversity and are currently threatened (Nigerian Conservation Foundation, 2006).

Wetlands in Bayelsa State have experienced a sharp decline; that continues persistently. Assessments indicate decline and increased vulnerability with over 60% of the landscapes lost from 1996 and 2022 (Edo and Albrecht 2021; Odubo *et al.* 2022, 2023; Marine and Bisong, 2024).

**Challenges of wetlands**

Bayelsa State wetlands are faced with different pressures that threaten their sustainability. The challenges are as follows:

Lack of research, documentation and ignorance: Bayelsa State wetlands have been greatly pressured by lack of research, documentation and understanding of the extent to which these ecosystems contribute to human wellbeing at all levels of society, especially amongst decision makers and project managers. Also evident are knowledge gaps on the status of wetlands, hence they are excluded from decision-making; putting constraints on the development of sustainable management.

Habitation pattern: The settlement pattern of the people of Bayelsa State also provides challenge to the wetlands. Most communities traditionally reside near the banks or some parts of wetlands which attracts developmental activities of government that directly impacts the wetlands.

Lack of legislation, political interest or will: Although, one Ramsar wetland (Apoi Creek Forest) and several other wetlands of significance exist in Bayelsa State, however, there are no direct laws which govern and/or regulate activities concerning wetlands; existing government policies are on urban development (Odubo *et al*. 2023). Wetlands Management regimes in the state are currently relaxed and mostly driven by traditional institutions and conducted through the designation of traditional reserves and harvesting periods. Political leaders of Bayelsa State never have any urge to manage or develop the wetlands. Till date there are no government frameworks or facility aimed at conservation, sustainable utilization or restoration of the state's wetlands. Subsisting laws and policy documents (such as the Forest Ordinance of 1901 and 1916, the Wild Animals Preservation Act (1916), the Federal Environmental Protection Agency (FEPA) Act (1988) etc. enacted by the Federal Government do not specifically address the wetlands as an ecosystem but are focused on forests, wildlife, and water resources, and they are weakly not enforced or implemented (Adekola *et al*., 2012); hence they have not been effective in addressing threats to wetlands (Orijemie, 2019). Moreover, most of the existing government legislations need to be reviewed taking into account the present-day knowledge and issues.

Resource exploitation is a major factor that pressurizes the wetlands in Bayelsa State. The ecosystems are resources rich; hence the resources are indiscriminately extracted and overexploited for direct consumption and livelihoods frequently resulting to wastage and contamination.

Corruption is another factor that puts pressure on wetlands in Bayelsa State. The state's wetlands is the

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host to the country's major revenue (crude oil), the corruption in the sector is pervasive and has exacerbated oil theft in the state's wetlands (Jonah *et al*, 2023). The enforcement of environmental laws particularly those dealing with wetlands is lacking, despite the massive and persistent degradation of the wetlands by individuals and corporate bodies, no violators are apprehended or prosecuted because the state and the country depends mostly from oil exploitation (Orijemie, 2019).

Conversion and modification is another challenge of wetlands in the state. Alteration of swamps prevents re-establishment of swamps. Folks from various coastal communities use the banks or some parts of wetlands for the establishment of fishing ports, coastal brewing activities and various cultural rituals/events. Also, various wetlands have been converted and drained for other uses including construction of roads, installation of oil well heads, pipelines, fish ponds, paddies etc.

**Causes of Wetland crisis in Bayelsa State**

Wetland degradation and destruction is a serious environmental problem in Bayelsa State and it is caused by natural factors and direct human activities.

Naturally, invasive plants and climate change induced events (Ramsar 2002) such as extreme weather events, warmer temperatures, increased sea level rise, intense and erratic rainfall events, increased frequency of storm surge, changes in water chemistry significantly alters the health, conditions and processes of wetlands; and their ability to function properly causing and exacerbating wetland destruction. Siltation by sand deposits due to the recurring floods and climate change induced habitat fragmentation also reduces the quality and functionality of wetlands further exacerbating their degradation.

Besides natural factors, direct human actions significantly cause wetland destruction in the state. These human actions are the primary drivers of wetland crises in the state. These include development and population pressure [rapid and uncoordinated urban sprawl, conversion, dredging (Odubo *et al.*, 2023)], pollution from oil and gas exploration and related activities (Numbere, 2020), unsustainable exploitation of resources.

Development and Population pressure: This is a major cause of wetlands degradation in the state. Urban sprawl and population growth pushes inhabitants towards the wetland areas in the state, which promotes developmental activities of government which directly impacts the environment of the wetlands. Folks also use the wetland banks and sometimes some part of wetlands as high platform ground for establishment of residences (fishing ports), coastal breweries or stage for cultural events/rituals. Also, corporations use wetlands for installations of well heads for crude oil; dredging of wetlands for laying of pipelines, digging and construction of roads and bridges without cconsideration of the natural flows of water which hampers the wetlands in the state.

Pollution from oil and gas related activities: This is another significant cause of the wetland crisis in Bayelsa State. Oil spills, waste disposal, and destruction of artisanal refineries by security operatives seriously degrade the state's wetlands.

Unsustainable use/Over exploitation of resources of the wetlands: The resources of the wetlands are over-harvested and extracted in unsustainable manners that cause their degradation and/or depletion. For instance, use of harmful chemicals and dynamites for fishing, and harvesting of both mature and immature bio-resources (periwinkles, trees etc.) resulting in detrimental effects on the wetlands.

**Consequences of Wetland Crisis in Bayelsa State**

The continuous degradation of wetlands in Bayelsa State poses various challenges to the locals and has further aggravated the the plight of the people of the state. The implications of the degradation and loss of wetlands in Bayelsa State is catastrophic and extensive, and have been experienced in recent times including:

Increased and severe impacts of global warming and climate change (coastal erosion, erratic and intense rainfalls, dry spells, flooding).

Increased vulnerability to natural disasters e.g. flooding (2012 and 2022), increased coastal erosions, and landslides.

Reduced productivity

**Bidiversity loss**: Unprecedented reduction in floral and faunal populations (watrshd birds, otters, amphibians, fishes, crustaceans etc.).

Loss of livelihoods and culture: Indigenous folks of coastal communities depend on the wetlands for their livelihoods (aquaculture, farming, lumbering, boatmaking, traps/basket-weaving, coastal brewing activities). Hitherto, basket/traps weaving and boat carving was abound as most of the families had a boat of their own for everyday use (e.g. collection minor forest produce, fish etc). However, there is a decline in number of people who have the knowledge/skill of boat making, basket/traps weaving. Also being lost is the culture and cultural beliefs associated with the occupations, most of the young folks have diversified and have little or on knowledge of the industry.

**Degraded water quality**: With reduced water filtration freshwater reserviours are threathened, communities are faced with higher pollution and

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contamination levels of water bodies, algal enrichments

Health risks: Communities are faced with health issues associated with reduced water quality e.g. disease outbreaks (cholera in 2024)

**Way forward**

From the foregoing, it is clear that wetlands degradation and loss results in a chain of negative consequences and the state is at risk. It is therefore crucial to take steps to arrest the situation to prevent future disasters. The wetlands crisis and the looming disaster can be addressed by adopting the following:

First, the protection and development of wetlands needs political will. The state government needs to strengthen its governance, regulatory and institutional capacity of wetlands management. According to the FEPA Act; states in the country are expected to set up their own environmental protection body for the protection and improvement of the environment (RFS), hence the enactment of state frameworks and laws limiting pollution and overexploitation of the state's wetlands and the will to enforce the laws is crucial.

Needed is implementation of ecosystem-based solutions such as wise use concept, incorporation of wetland protection into urban and rural development plans, wetland restoration initiatives. Also needed is provision of training to produce and improve scientific expertise and knowledge on wetlands management and monitoring.

Also crucial is the discouragement of the adoption of environmental unfriendly response by corporate bodies and security operatives to artisanal refineries. Wanton and indiscriminate dumping of oil, burning of equipments used for oil theft should be discouraged. Untreated and unregulated waste disposal must be checked.

Paramount is the engagement and encouragement of traditional/community-based participation and wetlands management approach supporting sustainable activities in conserving and restoring wetlands e.g. promotion of sense of ownerships, watchdogs. For instance, in Oporoma, Southern Ijaw LGA the traditional institution has long been regulating human activity on Boukpere Lake. It is the cultural practice that the lake is normally closed to fishing, logging, farming, or any other human activity until the time permission given by the leaders (the king and Inkiye, traditional spiritual leader).

Furthermore, addressing wetlands crisis requires trans-boundary cooperation and collaborations, it is imperative adopt policies guided by the Ramsar Convention on wetlands; also important is to lobby for more sites to be designated as important sites under the Ramsar Convention and collaborations to ensure the conservation, remediation and reclamation of wetlands.

Vegetation monitoring and establishment of protected areas to safeguard wetlands from destructive activities; adoption of green consumption habit, responsible resource exploitation and reduction of harmful waste is another important aspect of wetlands protection and is thus recommended.

**Conclusion**

Wetlands are distinct, incredibly biodiverse and precious ecosystems that are important in tackling climate change and water crises. Bayelsa State wetlands are of high ecological, economic and cultural value, playing vital roles in maintaining ecological balance and sustaining communities. Wetlands degradation is a serious environmental and systemic problem that requires cooperation and collaborations among stakeholders, academicians, policy makers, and needs to be tackled. The catastrophic effects of wetlands degradation are enormous; affecting ecosystem functions, resilience and livelihoods. Effective protection of wetlands in Bayelsa State can be achieved by accepting their importance in our wellbeing and development and on the planet.

Concerted and immediate efforts are needed to mitigate the damage done and prevent future harm to ensure continuous provision of their services, increase resilience as well as to ensure survival of societies.

**References**

Adekola, O. Whanda, S. and Ogwu, F. (2012). Assessment of Policies and Legislation that affect Management of Wetlands in Nigeria. *Wetlands* 32, 665 – 677

Ayanlade, A. and Proske, U. (2015) Assessing Wetland Degradation and Loss of Ecosystem Services in the Niger Delta, Nigeria. *Marine and Freshwater Research*, 67, 828-836.

Bayelsa State Oil and Environmental Commission - BSOEC (2023). An Environmental Genocide: Counting the Human and Environmental Cost of Oil in Bayelsa, Nigeria

Deguignet, M., Juffe-Bignoli, D., Harrison, I., MacSharry, B., Burgess, N. and Kingston, N. (2014) 2014 United Nations List of Protected Areas. UNEP-WCMC: Cambridge, UK. Available at: www.protectedplanet.net

Edo, I., and Albrecht, E. (2021). Threats to Niger-Delta Wetlands: A Case Study of Apoi Creek Forest. *Open Journal of Ecology*, 11(2), 136-147

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Efere, Z. S. and Ohwo, O. (2022). Vulnerability of Coastal Communities Sea level Rise in Brass Local Government Area, Nigeria. *Nigerian Journal of Environmental Sciences and Technology*, 6(1), 112-123

Erwin, K. L. (2009) Wetlands and global climate change: the role of wetland restoration in a changing world. *Wetlands Ecology and Management* 17:71–84

Jonah, P. S., Osita-Njoku, A. and Anyaoha, O. (2023) Government Neglect and Militancy in Bayelsa State: Implications for Sustainable Development (2011 – 2021). *African Journal of Social and Behavioural Sciences* 13(1)

Kumar. V. (2022) Wetlands: Kidneys of the Earth is at Risk. *Agriculture and Environment*, 3 (7), 19-25

Marine, A.T.A and Bisng, A. E. (2024). Impact of Land-Use Change frm 2000\-2020 n Environmental Resources in Bayelsa State, Nigeria *Journal of Applied Sciences and Environmental Management* 28 (5), 1519 - 1525

Niger Delta Master Plan (2005). Niger Delta Region, Land and People. *Niger Delta Regional Development Master Plan*. Federal Republic of Nigeria

Nigerian Conservation Foundation, (2006) Nigria Fifth Bidivrsity Rprt. http://www.ncfnigeria. org/web/inthenews.

Numbere, A. (2020). The Impact of Landscape Reclamation on Mangrove Forest and Coastal Areas in the Niger Delta Nigeria.

Odubo, E., Omidiji, A. O. and Mienye, E. (2023) Mapping the Gains, Loss and No Change of Wetland Area in the Yenagoa City Planning Area. *International Journal of Research in Environmental Science and Technology*, 9 (1), 99 – 115

Odubo, E., Weje, I. I. and Eighemhenrio, D.E. (2022) Urban Growth Dynamics and Wetland Changes In Yenagoa Planning Area, Bayelsa State, Nigeria 1996-2021 *Ethiopian Journal of Environmental Studies & Management*, 15(5), 642 – 653

Olalekan A. and Gordon M. (2011) The Niger Delta wetlands: threats to ecosystem services, their importance to dependent communities and possible management measures. *International Journal of Biodiversity Science, Ecosystem Services and Management*, 1, 1–19

Omodehin, A. O.; Idris, O. D. and Adeniyi, R. A. (2024). Wetland Change and its Implication on the Livelihoods of Coastal Community Dwellers in Apoi Creek of Bayelsa State *British Journal of Earth Sciences Research* 12 (2), 39-51

Orijemie, E. A. (2019). Cultural practices and Sustainable management of Wetlands in Nigeria *Proceedings of the 5th International Young Earth Scientists (YES) Congress* "Rocking Earth's Future 9 – 13 September 2019.

Okonkwo, N.P. Chidumeje, K.L. and Subhashni, T. (2015). The Niger Delta Wetland Ecosystem: What Threatens It and Why Should We Protect It? *African Journal of Environmental Science and Technology*, 9, 451-463

RCS (2007). Wise use of Wetlands: A conceptual framework for the Wise use of wetlands. Ramsar handbooks for the wise use of wetlands. 3rd ed. Gland (Switzerland): Ramsar Convention Secretariat.

RCS (2016). An introduction to the convention on wetlands. Ramsar Convention Secretariat, Switzerland.https://www.ramsar.org/sites/default/files/documents/library/handbook1_5ed_introduction to convention_epdf

Wali, E., Nwankwoala, H. O., Ocheje, J. F. and Chinedu, J. O. (2019) Oil Spill Incidents and Wetlands Loss in Niger Delta: Implication for Sustainable Development Goals *International Journal of Environment and Pollution Research*, 7 (1), 1-20

Yu, Z., Jiang, M., & Chen, F. (2023). Wetland Science, Ecosystem Services and Protection actions in China. *Fundamental Research*, 3(6), 831-832