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ADOPTING COMPLEMENTARITY AND RISK MANAGEMENT IN ADDRESSING THE CHALLENGES OF CLIMATE CHANGE IN NIGERIA

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Abstract

In this paper, we argue that Nigeria faces severe environmental degradation and socioeconomic disruptions driven by climate change phenomena, such as intense droughts, flooding, deforestation, and gas flaring. These ecological crises impair national economic growth, food security, and public health while triggering biodiversity loss and human displacement. This study evaluates the vulnerability and adaptive capacity of Nigerian communities and ecosystems to both slow-onset and acute climate impacts. It aims to demonstrate how government insensitivity, institutional corruption, and a fundamental lack of complementary ethics have exacerbated environmental degradation. Grounded in Innocent Asouzu's theory of Complementarity (Complementary Ethics) alongside legal and policy evaluation frameworks, the paper critically analyzes the relational dynamics between human activity, environmental governance, and ecological sustainability in Nigeria. The analysis reveals that systemic failures in enforcing existing environmental laws, alongside persistent anthropogenic activities—including gas flaring, illegal bunkering, and vehicle emissions—have severely damaged hydrological and ecological systems. To achieve long-term environmental sustainability, Nigeria must transition from an anthropocentric paradigm to a complementary ethic that views humans and the environment as interdependent entities. Effective climate risk management requires rigorous enforcement of environmental policies, continuous public education, integration of indigenous knowledge, stakeholder collaboration, and investment in green biotechnologies.

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Introduction

The issue of climate change is frequently undermined despite its severe effects on both humans and the environment. While many attribute climate change exclusively to natural forces, others regard it as a direct consequence of human activity. In reality, climate change—characterized by a sustained increase in average global temperatures—is both anthropogenic and naturalistic. Natural events and human activities jointly contribute to rising global temperatures, primarily driven by the accumulation of greenhouse gases (GHGs) such as carbon dioxide (CO2) in the atmosphere (Olaniyi *et al.,* (2013), McCarthy (2001) and Parry (2007). In Nigeria, persistent droughts, severe flooding, extreme heatwaves, off-season rainfall, and erratic dry spells have disrupted growing seasons across a country largely dependent on rain-fed agriculture (Olaniyi *et al.,* 2013). Consequently, water supplies for agriculture and hydropower generation are depleting rapidly, freshwater lakes are shrinking, and ecosystems are experiencing profound stress (Ogbo *et al*., 2013).

When excessive emissions of greenhouse gases pollute the atmosphere, they exacerbate the greenhouse effect and accelerate global warming (Enete, 2000; IPCC, 2014; Badru, 2020; Ani *et al*., 2022). Anthropogenic activities such as the burning of fossil fuels, rapid urbanization, deforestation, and gas flaring, combined with natural phenomena like continental drift, volcanic eruptions, and shifting oceanic and atmospheric currents, inevitably precipitate ecological disasters including desertification, severe erosion, and loss of biodiversity. Addressing these vulnerabilities requires the Nigerian government to enforce existing environmental laws and regulations proactively. Concurrently, the populace must adopt a framework of complementary ethics, wherein human beings and the natural environment are recognized as interdependent, complementary dimensions of reality. By fostering mutual harmony between humanity and nature, the hydrological and ecological systems currently disrupted by climate change can be restored. This paper is structured into three main sections. The first section examines the primary causes of climate change in Nigeria, highlighting that while natural forces play a role, human activities conducted without regard for environmental sustainability remain the main drivers. The second section demonstrates how risk management and policy enforcement can mitigate climate risks, arguing that administrative insensitivity and institutional corruption have hindered environmental governance. The third section proposes the adoption of Asouzu's complementary ethics as a philosophical and practical framework for addressing Nigeria's climate crisis, positioning humans and nature as interdependent partners in ecological sustainability.

Causes of Climate Change in Nigeria

i. **Deforestation:** Deforestation involves the large-scale clearing, burning, or felling of trees and natural vegetation (Badru, 2020). The widespread destruction of forests to accommodate industrial expansion, urbanization, road networks, and infrastructure projects poses severe environmental threats. Deforestation destroys local flora and fauna and exacerbates localized flooding in hilly and low-lying areas (Iyaji, 2011). Because forests serve as vital carbon sinks that absorb atmospheric carbon dioxide (CO2) through photosynthesis, their excessive clearance destroys green landscapes and increases localized heat, air pollution, and carbon concentrations, directly accelerating climate change (David & Edward, 2007). In other words, excessive and reckless removal

or cutting of trees for economic and domestic utilization destroys the green landscape and generates more heat, noise and pollution, which in turn affects the environment and brings about climate change.

ii. **Gas Flaring:** Gas flaring remains a prominent environmental hazard in Nigeria's petroleum sector. Rather than harnessing natural gas for domestic energy and export, industrial operators flare vast quantities into the atmosphere. Despite regulatory frameworks such as the National Gas Policy, the Flare Gas (Prevention of Waste and Pollution) Regulations of 2018, and the Nigerian Gas Flare Commercialization Programme (NGFCP), Nigeria consistently ranks among the top ten gas-flaring nations globally (Okoro *et al.,* 2021). Decades of gas flaring have polluted the air, degraded soil quality, reduced agricultural productivity, and impaired human and ecological health in oil-producing communities (Uwem & Akpan, 2017). Flaring associated gas represents an inefficient misuse of natural energy resources with profound adverse implications for macroeconomic stability and environmental sustainability (Tahouni *et al*., 2016). Globally, the idea of gas flaring is highly criticized as it hinders and jeopardizes both the environment and its inhabitants from thriving and flourishing.

iii. **Combustion of Fossil Fuels:** The heavy reliance on fossil fuels—namely oil, coal, and natural gas—for energy generation and transport is a major source of carbon emissions in Nigeria. The combustion of these fuels releases large volumes of greenhouse gases into the atmosphere, intensifying global warming and driving climatic instability (Ogbodo, 2013). Until sustainable and renewable energy alternatives are systematically adopted, fossil fuel emissions will continue to compromise environmental stability, which in turn bring about change in the climate, in one way or another.

iv. **Unregulated Urbanization and Poor Waste Management:** Rapid and unregulated urban growth in Nigerian towns and cities has severely strained municipal infrastructure. The lack of structured systems for collecting, transporting, treating, and disposing of solid waste leads to environmental contamination. Indiscriminate waste disposal, combined with inadequate urban planning and low public environmental awareness, results in clogged drainage networks, severe urban flooding, water contamination, air pollution, and localized biodiversity loss (Akpuogwu & Egbekpalu, 2022; Andrew, 2000). Environmental and climatic issues will persist until the populace puts an end to their awkward attitudes that often bedevil the environment. It is when this is done that the climate change which obstructs, in no minimal way, human, plant and animal species can be put to rest, for environmental sustainability.

v. **Emissions from Outdated Vehicles:** Vehicular emissions represent another major contributor to air pollution and environmental degradation in Nigeria. Due to widespread socioeconomic hardship and limited access to affordable brand-new vehicles, a vast majority of citizens rely on imported, highly aged, used vehicles (popularly known as Tokunbo). The proliferation of substandard vehicles discharging high levels of carbon monoxide and particulate matter directly degrades ambient air quality and increases public health risks (Green, 2018; Akpuogwu & Egbekpalu, 2022). This dynamic underscores the complementary relationship between socioeconomic well-being and environmental health: economic hardship drives practices that harm the environment, which in turn generates negative ecological feedback affecting human society.

Mitigating Climate Change through Risk Management and Policy Implementation

Mitigating the impacts of climate change in Nigeria requires strict compliance with established environmental legislation and regulatory frameworks. Relevant frameworks include the National Environmental Standards and Regulations Enforcement Agency (NESREA) Act, the Environmental Impact Assessment (EIA) Act, the National Oil Spill Detection and Response Agency (NOSDRA) Act, and the Flare Gas (Prevention of Waste and Pollution) Regulations of 2018. Rigorous enforcement of these laws would significantly reduce environmental pollution, mitigate ecological risks, and resolve resource-based conflicts. However, regulatory bodies and government institutions frequently display reluctance or inconsistency in enforcing compliance (Akpuogwu & Egbekpalu, 2022). Systemic corruption, administrative inertia, and weak institutional capacity allow environmental offenders to operate with impunity. Consequently, environmental degradation persists not from a lack of legal instruments, but from poor policy execution, insufficient climate risk management, and limited public awareness regarding environmental rights and conservation duties.

Adopting Complementary Ethics in Addressing Climate Change

In Innocent Asouzu's framework of complementary reflection, human actions derive moral legitimacy from their integration within a transcendent, complementary network of reality that recognizes the interdependence of all existing entities (Asouzu, 2024). Under this ethical paradigm, beneficial actions are defined by their orientation toward the common good and the flourishing of others (Etieyibo, 2020). Applied to environmental philosophy, complementary ethics posits that human existence ('to be') is intrinsically linked with the existence of the environment ('to be with others'). Man, animals, plants, and ecosystems form an interconnected web of reality (Ezugwu, 2022). It is in view of this that complementary ethics ought to be considered and treated not with levity, but as the only way the environmental problems that degenerate into climate change can be holistically and comprehensively addressed. Adopting complementary ethics challenges anthropocentric perspectives that treat nature as a mere instrument for human exploitation. Instead, it promotes environmental justice and health equity by recognizing access to clean air, safe drinking water, and uncontaminated land as fundamental rights for all communities (Obasa, 2025). In Nigeria, particularly within the Niger Delta region, decades of petroleum extraction have created severe environmental injustices. Local communities endure land degradation, water contamination, and health hazards arising from gas flaring, oil spills, and illegal artisanal refining, while remaining largely excluded from resource governance and economic benefits (Ejiba & Adams, 2016). Resolving these environmental and social inequities requires transitioning from exploitation to mutual complementarity. Achieving environmental justice entails integrating grassroots community leadership into environmental policy decisions, enhancing legal protections, ensuring transparent corporate accountability, and actively supporting regional development through institutional bodies such as the Niger Delta Development Commission (NDDC). Furthermore, involving environmental philosophers and ethicists in policy formulation can help embed long-term ecological stewardship into governance structures (Naess, 1973). When human society views nature as a complementary partner rather than an ancillary resource, environmental policy moves beyond short-term crisis management toward lasting sustainability.

Conclusion and Recommendations

This paper has examined climate change as a critical environmental challenge facing Nigeria. While climatic variations stem from both natural processes and human activities, anthropogenic practices—including deforestation, fossil fuel combustion, gas flaring, poor waste management, and heavy reliance on high-emission vehicles—are the primary drivers of ecological degradation in the country. The persistence of these problems is compounded by weak policy enforcement, institutional corruption, and an anthropocentric worldview that decouples human welfare from environmental stability. To address these challenges and foster long-term climate resilience, the following measures are recommended:

i. There is a need to promote public ethics and ecological education: Educational curricula and public awareness programs should integrate complementary ethics to foster a culture of environmental stewardship and mutual coexistence between humanity and nature.
ii. The environmental laws and regulatory sanctions must be enforced: Government regulatory agencies, including NESREA and NOSDRA, must enforce existing environmental statutes strictly, eliminate institutional corruption, and penalize corporate and individual environmental offenders.
iii. Local knowledge and procedural justice ought to be incorporated: Policy frameworks must include grassroots communities and indigenous knowledge systems in environmental decision-making, ensuring fair compensation and sustainable livelihood opportunities for resource-impacted regions., and
iv. The need for investment in green infrastructure and clean energy: The Nigerian government should incentivize renewable energy adoption, invest in modern public transportation, and support green biotechnologies to reduce carbon emissions and phase out obsolete, high-polluting technologies.

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