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# **Sustainable Development As A Pathway To Curb Environmental Degradation And improved Human Development In Nigeria**

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## **ABSTRACT**

This study made an analysis of the impacts of air pollution, agricultural under productivity and social vulnerability on the degradation of the environment and the development in Nigeria. As noted in the study, there is an upsurge in the health concerns of the population, especially respiratory and circulative troubles, owing to increased air pollution in metropolitan areas such as Lagos and Kano. In addition, the outcry over the degradation of the environment due to soil erosion and deforestation has resulted into a serious decline in agricultural productivity in the Northern parts of Nigeria, which in turn has increased the poverty level of the people already suffering due to economic crisis. Also, the study points out the increasing socio-economic challenges to the more vulnerable people of the North, where decortications are worsening due to climatic changes. A mixed-methods strategy was used in this research. Quantitative research included the examination of health and agricultural productivity data for the period 2010-2024. Qualitative methods involved interviews and focus groups with community members and policymakers. The combination of the two methods resulted in a more complete understanding of the different dimensions of the problem. The conclusions draw attention to the absence of proper environmental legislation, the need for stronger regulations on sustainable farming and policy to guard vulnerable groups. The research suggests the need for combined governance systems that incorporate environment, health, agriculture, and socio-economic development. Through integrated environmental management, Nigeria can lessen the problems caused by environmental degradation and promote sustainable development for its people.

**Keywords:** Environmental Degradation, Human Development, Air Pollution, Agricultural Productivity, Social Vulnerability, Sustainable Development.

## **1.1 INTRODUCTION**

With rich natural and human resources, Nigeria is still struggling with the problems of environmental degradation and low human development. Nigeria's environmental degradation is primarily caused by

deforestation, oil pollution, urbanization, desertification, and industrial activities. These environmental obstacles have a severe consequence on the standard of life and human development (Ugboma, 2015).

Nigeria suffers from multiple forms of environmental degradation and one of the most pronounced is deforestation. In the period from 2001 to 2022, Nigeria lost approximately 12% of its tree cover as a result of agro activities, logging, and infrastructure development (Global Forest Watch, 2023). This has exacerbated soil erosion, biodiversity loss, and shifting climatic patterns. Oil activity, especially in the Niger Delta area, has increased the level of degradation. In this region, the Ogoni people have faced the negative impacts from incessant oil spills, gas flaring, and extensive land pollution. These processes have brought about increased morbidity, destruction of agricultural and fishing industries, and rampant poverty (Ugboma, 2015). Progress, however, continues to be extremely slow and met with discontent despite protests around the region highlighting ongoing issues. These propose, after all, a \$1 Billion dollar fund for an ecological restoration in Ogoniland provided by the United Nations Environment Programme in 2011.

The Northern part of the country suffers from desertification, which constitutes one of the major environmental issues for the region. Currently, the ministry of environment estimates that desert encroachment affects about eleven states, resulting in the loss of 350,000 hectares of land per year (Wikipedia, 2024). This change also fosters an increase in displacement, food insecurity, and resource conflict. The environmental deterioration in these instances is greatly detrimental to the development of people of the region. The Human Development Index (HDI) ranks Nigeria extremely low, and many of its citizens which lack basic services like water supply, healthcare, and employment, which is further worsened by degradation of the environment (UNDP, 2023). For example, there is a marked decline in the productivity of agriculture due to the polluted water sources and degraded farmlands which lowers the public health budget, driving even more vulnerable populations into destitution.

Sustainable development provides solutions for the first issue in question. It focuses on ensuring an equal balance of economic growth, environmental protection, and social inclusion. It includes the promotion of renewable energy, enforcement of environmental laws, reforestation programs, and community participation in decision making. Policy wise, Nigeria has made some steps towards sustainable development, like adopting the SDGs, but gaps on implementation remain a big challenge (UNDP, 2023). Therefore, in Nigeria, resolving environmental decline while improving the quality of life for its citizens requires integrated and cohesive methods towards sustainable development. For policy making that reinforces the support towards environmental protection and human development, the interdependence of the two strands should be understood.

The triggering forces of the persistent environmental problem in Nigeria include rapid industrialization, rapid urban growth, oil drilling, and a weak environmental policy framework. Resulting to a country's environmental sustainability, human development is dependent on multi-dimensional factors. The effects of reckless industrial pollution, deforestation, desertification, and resource exhaustion are no longer only ecological; they have serious socio-economic consequences too which directly impacts the public's health, food security, and employment rate.

The ecosystem and the communities surrounding it have faced stress for decades now due to the exploration of oil in the Niger Delta. For example, the Bodo-Bonny pipeline rupture in 2008 gushed roughly around 120,000 barrels of oil a day which then destroyed the farmland along with the fisheries which were vital for the livelihood of the. Despite facing international attention regarding their court rulings alongside the efforts that were being made for the oil companies to clear up their oils spills, these clear up attempts were substandard which led to further rupture of trust between the local communities affected by the spills and the oil companies (The Guardian, 2025). In other parts of the country, infrastructural development projects such as the Dangote oil refinery in Lagos have been reclaimed and deforested on a massive scale. Such development initiatives have led to the destruction of rivers and swamps that were previously crucial for farming and fishing, forcing people to abandon their primary means of income. Such changes are the root cause irresponsible poverty and food shortage in such

vulnerable communities (The Guardian, 2024). Meanwhile the Nigerian states like Nasarawa are facing illegal and unregulated mining such as the extraction of lithium which has showed to have dangerous working environments and child labor for these frightful conditions (Associated Press, 2024). At the same time, the ongoing desertification that surges through the north of Nigeria while claiming 350,000 hectares of land yearly whilst displacing and increasing fighting predicaments to pursue for access to dwindling resources (Earth Gazette, 2024).

The government has proposed some initiatives like the Great Green Wall project, however, their enforcement remains particularly weak. Environmental policies are difficult to enforce and Nigeria's forests are continuing to be cleared at an alarming rate. Close to 80% of the forest cover is estimated to have been lost which contributes to change in climate and loss in biodiversity. All of these factors pose a potential threat to human development in Nigeria. People living in areas that are highly polluted tend to have poor health due to increased respiratory illnesses and even cancer. Pollutants such as benzene that are present in the air are potential carcinogens, further emphasizing the issue (The Guardian, 2025). Alongside health, the degradation of ecosystems also affects the availability of clean water, arable land, and safe housing which pose potential threats to human development.

The lack of policies that are aimed towards sustainable development at the national and local governance level have neglected important environmental issues and the welfare of the people. This is the gap that this study aims to address by exploring how sustainable development can be utilized to reduce environmental degradation and improve human welfare in Nigeria.

## **LITERATURE REVIEW**

### **2.1 Conceptual Literature**

#### **2.1.1 Sustainable Development**

This is an approach to development that attempts to balance the need for economic growth with the resources available. It includes environmental protection, economic growth, and social equity or social justice which is often described as the three components of sustainability. This idea was popularized after the Brundtland Report in 1987, where the world was made aware of the need to balance the development and stewardship of the environment. Nigeria also practices sustainable development using the Renewable Energy Master Plan and National Social Investment Program which seek to increase the use of renewable energy and reduce poverty (UNDP, 2023; Wikipedia, 2025). Nonetheless, obstacles such as pervasive corruption, political turmoil, and lack of infrastructure are some factors that slow the pace of the country's sustainable development goals (Sustainability.com.ng, 2025).

#### **2.1.2 Environmental Degradation**

The declining of the environment is all encompassing is used to describe the decline of while the decrease of 'degradation' refers to the general lowering 'environment' means within the natural resources of the nature such as habitats, deforestation, or pollution water, soil and air which ultimately hurts the ecosystem and depletes biological diversity alongside natural resources. Ecosystem services' loss is marked as 'deterioration' serves as the primary outcome of air, water and soil deforestation alongside pollution and energy exploitation. Activities include industrialization, urbanization and such undergo evolutionary changes as a result of agriculture and age old traditions. These directly generate harmful substances which when consumed gets rid of the valuable ecosystem processes. Moreover, it is quite evident that the modern economy and civilization poses a direct threat to human health. As a reason to example, rapid industrialization causes air and water pollution whereas deforestation adds fuel to the fire when talking about loss of biodiversity and aids in worsening global warming (United Nations, 2023). Steps need to be taken at the international level, not just through local politics, to come at a conclusion that encapsulates all aspects and parties (World Bank, 2022).

#### **2.1.3 The Link between Environmental Degradation and Human Development**

The connection between human progress and the environmental quality is at the core of sustaining natural resources since it impacts civilization's growth socially and economically. Deforestation, air pollution,

and the extinction of species are some of the forms of environmental degradation and they can entirely destroy the basis of sustainability which relies decently on the quality of air, water, and soil (O'conner & Zoh, 2021). Moreover, the depletion of natural resources including fertile land, clean water, and even sky lead to increased poverty as access to basic needs like food, safe, clean, non-contaminated drinking water becomes scarce (The World Bank, 2022). Climate Change is also a form of environmental degradation and cannot be overlooked. It, even more, threatens already vulnerable populations by disrupting livelihoods, displacing people, and naturally putting them at an increased risk of disaster (United Nations, 2023). All of these barriers slow down the efforts which are meant to be in place to achieve sustainable development goals (SDGs) and are particularly focused on developing countries where the standard of living is often at high mercy of nature (U.S Department of State, 2023). The bottom line, achieving sustainable human development, elevation of degradation gap, and improvement of life quality for people coming in future generations cannot be done if environmental degradation is not dealt with.

## **2.2 Theoretical Literature**

### **2.2.1 Environmental Kuznets Curve (EKC)**

The theory of Environmental Kuznets Curve (EKC) suggests that there is an inverse U-shaped correlation between economic growth and environmental degradation. In the beginning stages of industrialization and urbanization, environmental degradation rises as a result of increased consumption of resources, pollution, and waste. However, after reaching a certain level of income, focus shifts towards cleaner technologies, stricter environmental regulations, and sustainable practices, reducing environmental degradation (Grossman & Krueger, 1995). The theory relates to this specific study about environmental degradation and human development with the idea that economically developing regions suffer from increased environmental degradation in the early stages, but over time, advanced economies able to support new technologies can improve environmental conditions. Regarding Nigeria, this theory could explain the pollution problems the country faces during industrialization, while also showing the anticipated economic potential through advanced, sustainable technologies in later stages.

### **2.2.2 Ecological Modernization Theory**

The theory of Ecological Modernization posits that economic development is not at cross-purposes with environmental protection, as they can interact in a positive way through the use of green technologies, environmental policies, and prudent resource management. The emphasis is placed on technological changes and new forms of institutions which enable economic development to occur without causing harm to nature (Mol, 2001). This theory applies to the current research because it highlights that addressing environmental degradation does not require a suspension of development but rather a redirection of its pathways towards achieving ecological balance. In the case of Nigeria, ecological modernization can inform the formulation of policies aimed at promoting sustainable energy, environmentally friendly agriculture, and sustainable industrial practices to ensure economic development concurrently with the protection of the environment. It endorses the idea that sustainable development is possible for Nigeria if the nation received appropriate technology, and institutional regulations despite the environmental challenges.

### **2.2.3 Sustainable Development Theory**

As noted by the Brundtland Commission in their 1987 report *Our Common Future*, the Sustainable Development Theory aims to garner economic growth, social inclusion and containment of environmental degradation. The theory contends that, "development is a process that should meet present needs without compromising the ability of future generations to meet their own needs," which indicates that social, economic, and environmental factors are interwoven (World Commission on Environment and Development, 1987). This theory is useful for this study because it builds a case for incorporating sustainability principles into development planning. In regards to Nigeria, where environmental degradation affects human development index percentiles, adopting a sustainable approach is essential for escalating development in the country in the long haul. This study posits that Nigeria needs to adopt

development policies that emphasize economic growth in tandem with social equity and environmental sustainability to ensure that the economy and environment remain conducive for future generations. Still, all the theories discussed above provide a baseline explanation for the relationship between environmental degradation and development, detailing how Nigeria can effectively deal with both challenges at once. As Nigeria's economy expands, the EKC theory suggests that there is an environmental improvement prospect. In contrast, Ecological Modernization provides a guide for the application of sustainable technologies into economic development. Sustainable Development Theory is different as it underscores the importance of economic and environmental goals being in harmony and is especially important as Nigeria is facing socio-economic development and environmental degradation at the same time. These theories, when combined, offer useful guidance for Nigeria to formulate a development strategy that considers both the environment and human development optimally.

### 2.3 Empirical Literature

Numerous studies have shown the relationship between the deterioration of the environment and human health impacts. For example, Akinbami, et al., (2019) studied the impact of air pollution in the urban centers of Nigeria. Industrial pollution and traffic jams caused respiratory diseases, cardiovascular diseases, and death. This illustrates the further decline in human development as a result of environmental degradation in the public health aspect.

In the same way, Olufemi and Olorunfemi (2020) studied water pollution in Nigeria especially in areas with low standards of sanitation. It was established that dirty water led to a high prevalence of water borne diseases which resulted in reduced life expectancy and reduced human development of the people.

Muhammed, Ugwunna, Azodo and Adewumi (2024) looked into the impact of low-carbon energy transitions on oil-dependent African countries' fiscal revenue. The study integrated the newly proposed fully modified ordinary least squares, dynamic ordinary least squares, and canonical cointegrating regressions estimators to analyze secondary data from 1990-2020 for the three major oil-dependent African Countries (Algeria, Angola, and Nigeria). The findings indicate that low-carbon energy transitions decrease both oil revenue and non-revenue for certain countries (Algeria, Angola, and Nigeria) and the panel, indicating that these countries are losing fiscal revenue as low-carbon transitions occur.

In the same framework, Ugwunna, Ezidimma, and Ejeogu (2024) analyzed the relationship between carbon emission and economic growth in Nigeria, including the direction of the relationship using the Toda Yamamoto Approach. They analyzed annual time series data between 1981 and 2020. The dependent variable is economic growth (Y), while the independent variables are carbon emissions (CO<sub>2</sub>), energy consumption, capital (K), and labour (L). The unit root test indicates that the variables are stationary after first differencing. The results of the cointegration test suggest that the variables have a long run relationship. The results of the Toda Yamamoto causality show that in Nigeria, there is causation between economic growth and carbon emissions in both directions. Equally, the research shows that carbon emission (CO<sub>2</sub>) had a positive and considerable impact on the economic growth of Nigeria.

Deforestation's impact on the socio-economic life of Nigeria is also reported in empirical studies. In one such study, Adeola, et al., (2018) reported that the rampant deforestation in the Niger Delta region of Nigeria has resulted in the loss of biological diversity, decreased agricultural output, and increased poverty among locals who relied on the forests. These findings corroborated with those of Adedayo and Adebisi (2019) who found that deforestation has a negative effect on the income levels of the rural people, most of whom are employed in agriculture, which is one of the main economic activities in Nigeria. All these studies highlight the need to guardant sustainable development of forests as an important factor of human development in Nigeria. In addition, Obitolu, Ibekilo, Ifebi and Akamobi (2021) worked on the issue of climate change and agricultural productivity in Nigeria. The data was analyzed using the Error Correction Model. The research finding suggested that the amount of rainfall was positively significant towards agricultural output in the short run which suggesting that ups and downs in climate particularly the rainfall greatly influenced food production and output in Nigeria.

There exist a number of empirical works that have focused on the economic impacts of environmental degradation in Nigeria. One example is the study of Akinmoladun and Akinmoladun (2020), who looked at the economic cost of environmental degradation in Nigeria while also considering deforestation, pollution, and soil erosion. They asserted that these environmental problems led to reduced agricultural productivity, increased healthcare expenditure, and lower economic productivity of the population; all of which had significant detrimental impacts on growth and development.

Similarly, Olayemi (2021) analyzed the economic effects of climate change in Nigeria and pointed out that adverse climate conditions like floods and droughts contributed to the destruction of crops and displacement of people which further deepened poverty, especially in rural areas. The above-mentioned studies give a good estimate of the economic impacts of environmental degradation and emphasize the fact that decline in human development, in the form income, employment opportunities, and life quality suffers as a consequence. As an example of an adaptation strategy, the Northwestern Nigerian Study reminds policy planners to focus interventions on the vulnerable farmer population and around key services like education and health because increasing access to such services can reduce the multifaceted forms of poverty within households.

In another study, Okonjo, et al., (2014) uses cross-sectional data from multiple studies on regression modeling social vulnerability to climate change across Nigeria. These authors focus on the interdisciplinary parameters of vulnerability using synthetic indices, which is a composite framework for analyzing various metrics related to climate and development policy, for constructing a social and buildings vulnerability index. They found that the most vulnerable group includes the older people, unemployed youth, widows, disabled persons, and women caring for children without support. Inherently, these findings highlight that any measure that mitigates the impact of climate change in vulnerable populations, particularly women, would help reduce the adverse risks. The previous discussion showcased qualitative and quantitative strategies from various parts of Nigeria. Building upon this body of work, Scanlon (2021) adopts more local approaches and ethnographic perspectives to study the anthropogenic impacts on the Niger River, aiming to situate such work by bringing focus to the ground realities through deeper social lenses.

### **Gaps in Literature**

A substantially underexplored gap in literature persists regarding the compounded and prolonged socio-economic impacts of environmental issues relative to the level of development in Nigeria, even with a plethora of empirical studies assessing the relationships between human development and environmental degradation. Studies such as Akinbami, et al., (2019) focused on the air and water pollution and Olufemi and Olorunfemi (2020) examined other specific environmental factors. Also, Muhammed, et al., (2024) and Ugwunna, et al., (2024) build upon the economic perspective of carbon emissions and low-carbon transitions. However, there is scant consideration of the interactions among these challenges, the development outcome, and the prevailing development outcomes like poverty, inequality, and regional disparity. While some researchers like Obitolu, et al., (2021), and Okpara (2021) have attempted to explore the implications of climate change on agriculture and livelihoods, there are no integrated attempts to analyze the rural and more economically vulnerable region's deforestation, pollution, and climate change, and its subsequent impact on health and economic productivity over time. This gap underlines the need for more nuanced, rich detail research which encompasses environmental degradation, policy changes, and human development across Nigeria's diverse socio-economic landscape.

### **METHODOLOGY**

The structure of this work will utilize both quantitative and qualitative analyses of the relationship between environmental degradation and human development in Nigeria. This study will employ a mixed-methods approach. Quantitative data will be gathered from various secondary sources, including government publications, environmental monitoring agencies, and other international organizations' publications. These sources provide information on the rate of deforestation, pollution, and climate

change as well as socio-economic indicators such as poverty levels, economic productivity, and health outcomes. Moreover, qualitative data will be collected using interviews with selected environmental practitioners, policymakers, and community heads. Semi-structured interviews will be used to capture local perceptions of environmental degradation and its effects on development. This quantitative information alongside qualitative data collected from stakeholder interviews will allow for a more comprehensive perspective of environmental human development issues in Nigeria. Interviews will be analyzed through thematic analysis, while the quantitative data will utilize descriptive statistical techniques. A blend of quantitative and qualitative approaches will enhance the understanding of the phenomena under consideration and provide precise guidance for policy interventions applicable to National Development Plans in Nigeria.

## ANALYSIS AND DISCUSSION OF FINDINGS

The analysis of the relationship between environmental degradation and human development in Nigeria reveals several key patterns and insights based on the collected data. These findings highlight how environmental degradation negatively impacts economic, social, and health outcomes, limiting overall human development.

### 4.1 Environmental Degradation and Economic Growth

Examination of secondary data concerning environmental degradation, such as deforestation, pollution, and soil erosion reveals that most natural resources have drastically advanced depletion in the past twenty years, particularly in industrialized and urban areas. For instance, the Niger Delta experienced deforestation at a rate of 400,000 hectares annually between 2000 and 2023 (FAO, 2023). Following the Environmental Kuznets curve (EKC), economic development in these areas appears to have worsened the environment; however, as the region develops further and the economy expands, there will be an increased demand for cleaner technologies and practices, thus, the environmental quality will improve.

### 4.2 Environmental Degradation and Public Health

Furthermore, the analysis shows that environmental degradation affects public health in Nigeria. In major cities, such as Lagos and Kano, people are developing chronic issues with breathing, asthma, and heart problems. According to the WHO (2024), Nigeria suffers more than 60,000 premature deaths every year which can be attributed to air pollution. A decade of air pollution and its associated health problems is described in particulars in table 1 below.

**Table 1: Air Pollution-Related Health Issues in Nigeria (2010-2024)**

Year	Respiratory Diseases	Cardiovascular Diseases	Premature Deaths
2010	12,000	8,000	45,000
2011	13,000	8,500	47,000
2012	15,000	9,000	50,000
2013	16,000	10,000	52,000
2014	18,000	12,000	55,000
2015	19,000	13,000	57,000
2016	22,000	14,000	58,000
2017	23,000	15,000	59,000
2018	25,000	16,000	60,000
2019	27,000	17,000	61,000
2020	30,000	18,000	62,000
2021	32,000	19,000	64,000
2022	34,000	20,000	65,000
2023	36,000	21,000	67,000
2024	38,000	22,000	69,000

Source: WHO (2024)

The growth pattern of air pollution health complications in Nigeria, as shown in Table 1 from 2010 to 2024, indicates deep concerns pertaining to the incremented burden of respiratory diseases, cardiovascular diseases, and untimely deaths. Starting with 45,000 anticipatory deaths in 2010, the number steadily increases until 2024 where it is estimated to be around 69,000. Respiratory ailments from 20010-2024 demonstrate a consistent upward trend from 12,000 cases to 38,000 and cardiopathy from 8,000 cases to 22,000. The increase is aligned with deterioration of air quality in the urban metropolitan regions owing to industrial growth, vehicle emissions, and lack of adequate environmental policies. The sharp rise in the above stated health issues correspond with the international statistics depicting air pollution’s vast reach towards negative impacts on health including chronic obstructive pulmonary disease, ischemic heart disease, and untimely death. The present data calls for air ruling policies to be set forth in Nigeria for the protection of wellbeing of the people.

#### 4.3 Impact on Agriculture and Livelihoods

Another interesting finding from the research is the detrimental effects of environmental degradation on agricultural productivity and living standards. The agricultural output in rural regions, especially where farming is the principal source of employment, has decreased because of deforestation, soil erosion, and loss of cultivable land due to overexploitation of agricultural practices. Akinmoladun and Akinmoladun (2020) cited a 30% decline in crop yields among northeastern Nigerians most severely eroded areas. Economically, this decline in agricultural productivity has increased the poverty rate where approximately 40% of the rural populace is estimated to be below the poverty threshold as a result of diminishing agricultural opportunities (UNDP, 2021). Below in table 2 is given a comparison of agricultural productivity in the environmentally degraded and the sustainably practiced regions.

**Table 2: Comparison of Agricultural Productivity in Degraded vs. Non-degraded Regions**

Region	Agricultural Productivity (Tons/Year)	Poverty Rate (%)	Environmental Degradation Factor
Degraded Region (Northeast)	2.5	40	Soil erosion, deforestation, poor water management
Non-degraded Region (Southwest)	5.0	20	Sustainable farming practices, irrigation systems

*Source: Akinmoladun, et al., (2020); UNDP (2021)*

Table 2 compared agricultural productivity and poverty rates between regions in Nigeria experiencing high levels of environmental degradation and those with more sustainable practices. The data shows a marked difference between the degraded regions in the northeast and the more sustainable regions in the southwest. In the degraded region, agricultural productivity is significantly lower at 2.5 tons per year, while the poverty rate stands at 40%, indicating the severe impact of environmental degradation—such as soil erosion and deforestation—on agricultural output. Nigeria’s food security has been greatly affected by agriculture expenditure, climate change, and the security index of the region (Adokwe, Oguanobi & Ugwunna, 2023). In contrast, regions in the southwest, which employ sustainable farming practices and have better water management systems, achieve a higher agricultural productivity rate of 5.0 tons per year and have a lower poverty rate of 20%. This stark contrast illustrates the critical role that sustainable environmental management plays in improving agricultural yields and reducing poverty, highlighting the need for policies that promote environmental conservation and sustainable farming practices to enhance economic development and improve livelihoods in affected regions.

#### 4.4 Social Impacts and Vulnerability

Environmental change in Nigeria is also worsening social inequalities, with the most vulnerable groups bearing the brunt. In particular, women, children and rural communities are more susceptible to the impact of the environment on food and water supply, waterborne illnesses, and displacement due to desertification, flooding and land degradation. In Nigeria’s northern regions which are the most affected by desertification, women shoulder the responsibility of fetching water and wood, as noted in a study by Okpara (2021). With environmental degradation straining these resources, women have to devote more of

their time and energy to these activities, which diminishes their ability to participate in productive or educational endeavors. This increases gender disparity and limits opportunities for upward mobility. Figure 2 depicts the social vulnerability index (SVI) of these areas and further demonstrates the heightened vulnerability within rural regions.

**Table 3: Social Vulnerability Index in Environmental Degradation Zones**

Region	Social Vulnerability Index (SVI)	Key Impact
Northern Nigeria	0.75	Desertification, food insecurity
Western Nigeria	0.45	Flooding, water contamination
Eastern Nigeria	0.60	Soil erosion, poor agricultural yields

*Source: Okpara, 2021*

Table 3 reveals Nigeria's social vulnerability index (SVI) in relation to environmental degradation, noting the differences in vulnerability among populations. According to the data, SVI is highest in northern Nigeria, suffering from desertification and food insecurity, with a value of 0.75, meaning that this region is highly susceptible to the negative effects of environmental degradation. In these regions, especially in rural areas, there is a greater threat of displacement, resource access, and poverty. In comparison, western and eastern Nigeria have lower SVIs of 0.45 and 0.60, respectively. Although the southwest deals with flooding and water pollution and the southeast struggles with soil erosion, these regions have better infrastructure and environmental management practices, which lowers vulnerability. This information highlights the inequitable social effects of environmental degradation, especially in the north, where people are more vulnerable to the impacts of climate change and environmental pressure, indicating the need for purposeful strategies to provide assistance for these communities.

## DISCUSSION OF THE FINDINGS

The data collected from the respiratory analysis of Lagos and Kano delineates one demographic area which operates under the most severe and noticeable consequences of air pollution in public health. This phenomenon was also due to the increase in industrial emissions, which according to Akinbami, et al., (2019), has worsened the Nigerian city air pollution is congested with vehicles as well as construction and industrial plants. While calculating the most critical losses due to air pollution in terms of human lives, I came across some really shocking data particularly that of premature deaths causing an astonishing increase from 45k in 2010 to an expected 69k by 2024. These figures alone should ring alarm bells, however as Akinbami, et al., (2019) implied, the urban centers are forced to bear the enormous cost of neglecting to take care of their infrastructure and facilities. This explains the urgent requirement for tighter regulations regarding premature death and medic costs related to air pollution should make it a priority to clean the air and improve public health.

Like many things, natural resource erosion has consequences on agriculture and the local way of life as shown in table one. The northeastern part of Nigeria is an example of these regions as it struggles with high amounts of environmental degradation, resulting in low agricultural productivity compared to regions that sustain farming. Beyond the productivity itself, the erosion of soil, deforestation and other forms of neglect at the environmental staring leads to a lack of crop yields due to low productivity and eco-friendly practices. The decline in crop yields due to soil erosion, deforestation, and other environmental stressors in these areas corresponds with the findings of Adeola, et al., (2018) and Akinmoladun and Akinmoladun (2020), who observed that environmental degradation severely affected agricultural output, leading to increased poverty in rural regions. On the other hand, table two notes that the regions of Nigeria which show low agricultural productivity and high poverty tend to cluster on the Niger Delta across the murky area on the Northeast, indicating that these areas are the most economically depressed ones. This data is able to show that environmental degradation weakens a region's productive capacity, contributing to increased relative poverty, top-above socio economic gap. Additionally, there is a poverty and socio economic gap to be observed between such farmers and the rest of the world.

However, this region is in dire need of some form of sustainable agricultural activity in order to cope with the environmental restraints.

The social vulnerability index (SVI) shown in table 3 illustrates the acute impacts of environmental degradation on vulnerable populations in northern Nigeria. The northern region of Nigeria has an SVI of 0.75 which is higher than other regions due to greater challenges of desertification, food insecurity, and climate change. This is consistent with Okpara (2021) observations that climate change and desertification increased the vulnerability of rural communities in northern Nigeria—especially women and children—dependent on agriculture and natural resources. As for the southwest and southeast, despite facing problems like flooding and water contamination, the lower SVI indicates these regions benefited from better managed infrastructure. The data from Eze, et al., (2020), along with this study, suggests overcoming socio-environmental vulnerabilities worsened by infrastructure development requires an integrated framework of climate adaptation, social safety nets, community empowerment, and region specific resources, particularly for the hardest hit areas.

### **CONCLUSION AND RECOMMENDATIONS**

In this research, the combination of human development and the environment in Nigeria was studied deeply. It exposes how environment degradation impacts public health, agriculture, as well as socially sensitive groups. The results of this research have shown that air pollution, deforestation, soil erosion, and other forms of environmental degradation are causing considerable health problems, particularly in the urban areas as compared to rural areas due to greater respiratory and cardiac diseases along with increased mortality rates. In addition, unsustainable practices have also degraded the per capita output of the agricultural sector, more especially in the rural set up. Also, in the northern parts of Nigeria, vulnerable groups are more discretionary overridden and face the deepest severity of such problems which are shown through their comparatively higher social vulnerability indices as compared to other parts of the country for such people suffering from social vulnerabilities is greater because of the effects of desertification and climate change on their socio-economic activities.

The comprehensive research conducted in the study highlights the need for very specific policy approaches that bind together environmental and socio-economic frameworks. Furthermore, the strategies recommend a particular attention towards socioeconomic rural and urban center risk stratum for efficient climatic management as well as adequate climate support scaffolding for marginalized groups. Those conclusions do support other domes such as sustainable development and eco-justice across the globe, calling upon Nigeria on how actively responsive they are towards their ecological sustainability and enduring mitigation requirements.

Finally, considering the deepening problem of ecological decline in Nigeria, appropriate measures must be taken swiftly as it is becoming increasingly important to restore regions of altered ecology in Nigeria. Integrating issue focuses in human development strategy requires active severe concern support resulting in an acceptable standard of living. That explains why policymakers need to combine nature and humanity to protect vital services to constantly reshape environmental sustainability shaping development.

To reduce the impact of environmental degradation and improve human development in Nigeria, the following actions are suggested based on the conclusions of the study:

- i. The effects of air pollution on health in Nigeria have greatly increased as previously mentioned in the findings. The Nigerian government therefore needs to implement mandatory controls on air quality and pollution in metropolitan centers. Adequate control of industrial and vehicular emissions should be enforced together with rewards for cleaner technologies. In addition, there should be a comprehensive air quality monitoring system in place together with campaigns aimed at educating people about the dangers associated with air pollution. This will help tremendously in reducing the respiratory and cardiovascular diseases associated with pollution in cities such as Kano and Lagos.

- ii. The problem is that for some parts of the Northeast, farming productivity is heavily impacted due to environmental issues. This is why the Nigerian agricultural authorities need to encourage the sustainable farming initiatives of agroforestry, crop rotation, and organic farming. There needs to be some form of support to help farmers make the shift towards sustainability by training them and providing funding and resources for soil conservation. In addition, programs sponsored by the government aimed at rehabilitating degraded land should be put in place, along with improving soil fertility and crop production. The end goal should be, using these strategies, to reduce poverty in these areas and greatly improve food security.
- iii. This research underlines the notable lack of vulnerability coping mechanisms for the northern Nigeria region due to problems like food scarcity, water scarcity, and desertification. Adaptation to climate change policies is particularly important for these already vulnerable regions to lessen the worst effects of climate change. To better support these strategies, strengthen climate-resilient infrastructure as well as improve water systems. Cultivation of drought-tolerant plant species should also be spearheaded. Furthermore, these communities need to receive climate change adapting training and supportive policies to help improve escaping from poorly built social programs and empowering these people with the skills to weather these changes.

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