

Crimes Against Biodiversity in Nigeria: A Search for Sustainable Development

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Abstract

Objective: This study aims to examine the nature and types of crimes against biodiversity in Nigeria, identify their causes, and assess their consequences, particularly in relation to sustainable development.

Method: The study is cross-sectional in nature, employing a descriptive survey design with primary data collection methods. Data were gathered through an online platform, eSurveysPro.com, and analyzed using percentages, mean, and standard deviation.

Result: The findings reveal that crimes against biodiversity significantly hinder Nigeria's sustainable development. The most frequent types of crimes against biodiversity include pollution and environmental degradation, poaching and bush meat hunting, illegal logging and timber trade, as well as habitat destruction and land conversion. Key causes identified include poverty, weak law enforcement, poor governance, lack of public awareness, high demand for wildlife and natural resources, and conflict/insecurity. These crimes result in loss of ecosystem services, disruption of ecological balance, economic losses, health risks, and increased food insecurity.

Conclusion: The research concludes that strengthening law enforcement, enhancing public awareness, promoting environmental education, improving monitoring and research, and fostering community engagement are essential to curb crimes against biodiversity, thereby paving the way for sustainable development in Nigeria.

Keywords: biodiversity; crime; habitat destruction; poaching; pollution; sustainable development; logging.

Introduction

Crime refers to illegal activities that harm individuals, groups, or society as a whole. In Nigeria, crime takes many forms, including terrorism, kidnapping, corruption, and cybercrime, among others. Biodiversity refers to the variety of living organisms, their genetic diversity, and the ecosystems they form. Nigeria with a human population of 221, 616, 165 million people with the population density of 226 per km² and total land area of 910,770 km² (351,650 sq. miles) is home to a diverse range of ecosystems, including rainforests, savannahs, wetlands, and coastal regions, which support a variety of flora and fauna, including endemic and endangered species. (Okoli & Ochim, 2016).

The importance of Nigeria's biodiversity in maintaining and stabilizing ecosystems through the interaction of different species for survival cannot be underestimated. Economically, biodiversity supports the growth of industries such as agriculture, forestry, and fisheries, providing food, raw materials, and income opportunities for communities and tourism, with wildlife reserves and natural habitats serving as popular destinations. Also, Nigeria's diverse flora and fauna offer a rich source of medicinal plants and traditional knowledge. Many indigenous communities rely on these resources for their healthcare needs. Biodiversity also serves as a potential source of future medicines and pharmaceutical discoveries. Additionally, healthy ecosystems and diverse vegetation help regulate climate patterns. Biodiversity provides numerous ecological services, including pollination, water purification, soil fertility, and natural pest control. These services are vital for agricultural productivity, ensuring food security and sustainable land use practices. Culturally, biodiversity holds significant cultural and spiritual value for many Nigerian communities as traditional practices, rituals, and folklore are often intertwined with nature and specific species. Preserving biodiversity, therefore, helps protect cultural heritage and maintain connections to ancestral traditions.

Nigeria has recognized the importance of biodiversity conservation and has implemented several initiatives to protect its natural resources. These efforts include safeguarding critical habitats and protecting endangered species in National Parks and Wildlife Reserves. Examples include Yankari National Park, Gashaka Gumti National Park, and Cross River National Park. Other policies to protect biodiversity are the establishment of Biodiversity Research and Monitoring to assess biodiversity status, identify threats, and develop conservation strategies. Legal Frameworks, such as the Endangered Species (Control of International Trade and Traffic) Act and the National Environmental Standards and Regulations Enforcement Agency (NESREA) Act, are examples of legislation that protect biodiversity, wildlife trade and habitat destruction. Additionally, community engagement involving local communities in conservation efforts is crucial for the long-term success of sustainable livelihood projects and environmental education programs, as it helps raise awareness and promote active participation in biodiversity conservation (Rampheri & Dube, 2021; Uguma & Timothy).

Historically, Nigeria became a signatory to the Convention on Biodiversity (CBD) in 1994, committing the country to the three objectives of the convention: the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of resources arising from the effective use of genetic resources. The Nigerian environment is blessed with rich ecological potential necessary for human development and transformation. It is currently threatened with decline in both quality and quantity at an alarming rate due to overexploitation and misuse (Anwadike, 2020).

Sustainable development, on the other hand, is a concept that emphasizes the need to meet present development needs without compromising the ability of future generations to meet their own needs (International Institute for Sustainable Development, 2022). It involves achieving a balance between economic growth, social well-being, and environmental protection. Crimes against biodiversity refer to those committed by individuals in violation of a country's environmental protection laws. Nigeria, like many other countries, is facing various crimes against biodiversity. They include, but are not limited to, wildlife trafficking, illegal logging, the bushmeat trade, bush burning, habitat destruction, pollution and waste disposal, illegal fishing, and the introduction of invasive species, which have detrimental effects on the nation's biodiversity. These activities undermine the integrity of ecosystems, disrupt ecological balance, lead to species loss, and hinder the country's prospects for long-term sustainable development. Additionally, the crimes against biodiversity in Nigeria have implications beyond national borders. Nigeria serves as a source, transit, and destination country for the

illegal wildlife trade, contributing to the global decline of endangered species and undermining international conservation efforts (Szaro, 2008).

Data from the United Nations Office on Drugs and Crime (Canton, 2021) shows that while these wildlife and environmental crimes are reducing globally, it is getting worse in Nigeria. For instance, in January 2021, the Nigeria Customs Service (NCS) seized a 20-foot container at the Apapa Port containing parts of various endangered species. In the container were 2,772 pieces of elephant tusks of different shapes weighing about 4,752kg; 162 sacks of pangolin scales weighing 5,329kg; 5kg of rhino horns, dried and fresh wildlife bones; 103 kg of skulls suspected to be of lions and other wild cats, and 76 pieces of timber (semi-processed and processed) (UNODC, 2021).

The data from seized shipments in the World Wildlife Seizures (World WISE) database shows Nigeria in the top five globally for both source and destination countries over the last decade. The established trade routes and robust ports have been exploited by organized criminal networks for illicit purposes, with illegal products sourced from West and Central Africa, consolidated in Nigeria, and then shipped overseas. Sadly, arrests and convictions for wildlife and environmental crimes across the value chain are rare, mainly due to a lack of awareness and understanding of these crimes (Abeku, 2023).

From the foregoing, it is evident that biodiversity resources are under significant threat of extinction if necessary measures are not taken to avert it, hence the need for this study. Nigeria has variable climatic conditions and physical features, which have combined to create some of the richest floral and faunal biodiversity in Africa (Kingsley, 2022).

The country's natural ecosystems range from semi-arid savannas to mountain forests, rich seasonal floodplain environments, rainforests, vast freshwater swamp forests, and diverse coastal vegetation. Nigeria's Niger Delta contains the largest mangrove habitats in Africa. Currently, Nigeria is estimated to host over 864 bird species, 117 species of amphibians, 203 reptiles, more than 775 fish species, 285 mammals, and over 4,715 species of vascular plants. There are likely to be many more undocumented species (National Strategy to Combat Wildlife and Forest Crime in Nigeria, 2022-2026).

However, the country's natural resources are being depleted at an alarming rate due to human pressure, mainly through land-use change and overexploitation via hunting, logging, and fishing. Crimes against biodiversity, therefore, are one of the major problems confronting Nigeria's sustainability, worthy of interrogation. Arising from the attendant consequences of crime against biodiversity in Nigeria, which may impede sustainable development, this study therefore poses the following questions:

- i. What is the nature or types of crimes against biodiversity in Nigeria?
- ii. What are the causes of crimes against biodiversity in Nigeria?
- iii. What are the consequences of various crimes against biodiversity in Nigeria, particularly on sustainable development?

The objectives of the study are primarily to establish the relationship between crime against biodiversity and its negative impact on Nigeria's sustainable development. In doing so, the study was anchored on the following objectives, which include:

- i. To examine the nature/types of crimes against biodiversity in Nigeria;
- ii. To know the causes of crimes against biodiversity in Nigeria;
- iii. To assess the consequences of various crimes against biodiversity in Nigeria, particularly on sustainable development.

Research Gap and Significance

Several studies have been carried out on the nature of biodiversity in Nigeria. For example, Nwani, Okonkwo, and Ezike (2020) conducted a review of the illegal wildlife trade and biodiversity conservation in Nigeria. Ogogo, Ogogo & Ugbomeh (2021) studied the Dynamics and implications of illicit wildlife trade in Nigeria. Aminu-Kano, Ibrahim & Abdullahi (2018)

researched on Wildlife poaching and livelihood sustainability in some selected communities of Niger state. Oyatoye, Akinsanmi, and Adeoye (2020) conducted an overview of illegal logging and its environmental impacts in Nigeria. None of these studies has specifically examined Nigeria's various crimes against biodiversity. Hence, this study aims to fill the existing knowledge gap by understanding the relationship between crime, biodiversity, and sustainable development in Nigeria. Such insights and recommendations will be valuable for policymakers, conservation practitioners, and stakeholders in designing and implementing effective measures that integrate biodiversity conservation into national development plans, foster sustainable livelihoods, and safeguard ecological integrity for future generations.

Conceptualization

Crime

Sociologists define crime as “any act considered socially injurious and punished by the state, regardless of the type of punishment” (Clinard & Meier, 1963). The limitation of this type of definition is that actions that are injurious but not punished by the state may not be regarded as a crime, which is a far cry from reality. Better put by the researchers within the context of this study, crime is any socially injurious act which may be punished or not by the state, which affects the people and the environment. Biodiversity refers to the variety of life forms, including plants, animals, and microorganisms, found in a particular region or ecosystem. Nigeria, being a country with diverse ecosystems ranging from rainforests to savannahs, exhibits significant biodiversity.

Sustainable Development

Sustainable development, on the other hand, is a concept that emphasizes the need to meet present development needs without compromising the ability of future generations to meet their own needs (National Strategy to Combat Wildlife and Forest Crime in Nigeria, 2022-2026). It involves achieving a balance between economic growth, social well-being, and environmental protection. Crimes against biodiversity refer to those committed by individuals in violation of a country's environmental protection laws.

Nature/types of crimes against biodiversity in Nigeria

Biodiversity in Nigeria is seriously under the threat of extinction from climate change, economic development, land use changes from agriculture, invasive species introduction, pollution, crude oil exploration and exploitation, canalization that has threatened mainly the mangroves, deforestation, desert encroachment, over hunting, land use, road and residential buildings construction etc. According to the Living Planet Report (Leung et al., 2022), natural habitats in Africa are being lost due to anthropogenic activities, such as overharvesting of resources, most notably timber. Since 1970, more than 21 million hectares of forest have been lost. Other threats to terrestrial habitats include bushfires, particularly in the savanna, soil preparation for agricultural purposes, overfishing, deforestation, and road construction. Aghede (2004) stated that all 36 states of Nigeria, including the Federal Capital Territory (FCT), are adversely affected by soil erosion due to the construction of residential and commercial centres, among other factors. In Nigeria, desert encroachment is advancing southward at an estimated rate of 0.6 km per year, affecting the states of Borno, Jigawa, Katsina, and Kebbi. The nature and types of crimes against biodiversity in Nigeria include the following:

1. **Illegal Wildlife Trade:** Nigeria is a hotspot for illegal wildlife trade due to its rich biodiversity. This trade involves the illegal hunting, capturing, buying, selling, and smuggling of protected and endangered species, as well as their parts and products. Nigeria serves as a source, transit, and destination country for wildlife trafficking, involving species such as elephants, pangolins, primates, and reptiles. The illegal

wildlife trade poses a significant threat to the survival of these species, disrupts ecosystems, and undermines conservation efforts (Kingley, 2022)—this type of crime against biodiversity cuts across all regions in Nigeria.

2. **Poaching and Bush Meat Hunting:** Poaching refers to the illegal hunting, capturing, or killing of wildlife, often for commercial purposes. Bush meat hunting, a form of poaching, involves the illegal hunting and consumption of wild animals for food. Both activities contribute to the decline of various wildlife species, including elephants, rhinoceroses, lions, primates, and antelopes. Poaching and bushmeat hunting disrupt ecological balances, reduce biodiversity, and can lead to the spread of zoonotic diseases (Nwani et al., 2020)—this type of crime against biodiversity affects all regions in Nigeria.
3. **Illegal Logging and Timber Trade:** Nigeria's forests are home to diverse plant and animal species, but they face significant threats from illegal logging. Criminal activities include unauthorized tree felling, transportation, and trade of timber, often in protected areas or without proper permits. Illegal logging contributes to habitat destruction, the loss of plant and animal species, and exacerbates soil erosion, while also intensifying the impacts of climate change. The timber trade associated with these activities contributes to deforestation and forest degradation (Oyatoye et al., 2020); this type of crime against biodiversity affects all regions in Nigeria.
4. **Habitat Destruction and Land Conversion:** Habitat destruction and land conversion for agricultural purposes, urbanization, infrastructure development, and mining operations are significant threats to biodiversity in Nigeria. Natural habitats, such as forests, wetlands, and grasslands, are cleared or modified, resulting in the loss of critical ecosystems and the displacement of wildlife populations. Habitat destruction and land conversion fragment landscapes, disrupt ecological processes, and threaten the survival of many species (Adeola et al., 2020).
5. **Pollution and Environmental Degradation:** Pollution and environmental degradation pose significant threats to biodiversity in Nigeria. Activities such as oil spills, chemical pollution, improper waste disposal, and industrial activities contaminate ecosystems and water bodies, negatively impacting plant and animal species. Oil exploration and production activities in the Niger Delta have caused extensive damage to mangroves, aquatic ecosystems, and marine life. Pollution and environmental degradation degrade habitats, reduce species abundance and diversity, and disrupt ecological functioning (Ojo et al., 2020).
6. **Illegal Fishing and Overexploitation:** Illegal fishing and overexploitation of fish stocks in Nigeria's marine and freshwater ecosystems contribute to the decline of fish populations and marine biodiversity. Destructive fishing practices, the use of illegal gear, and the violation of fishing regulations contribute to the depletion of fish stocks, damage to marine habitats like coral reefs and seagrasses, and the collapse of fisheries. Illegal, unreported, and unregulated (IUU) fishing exacerbates these problems, undermining sustainable fisheries management and threatening the livelihoods of fishing communities (Nwani et al., 2020).
7. **Invasive Species Introduction:** The introduction of non-native invasive species poses a significant threat to Nigeria's native biodiversity. Invasive species can outcompete native species, disrupt ecological interactions, and lead to the decline or extinction of indigenous flora and fauna. They often colonize disturbed areas, which affects ecosystem functioning and threatens native species. Invasive species are introduced through activities such as the pet trade, accidental transportation, and inadequate biosecurity measures (Borokini, 2012; Suleiman et al., 2021).

Causes of crimes against biodiversity in Nigeria

The causes of crimes against biodiversity in Nigeria can be discussed as follows:

1. **Poverty and Livelihood Pressures:** Poverty and limited economic opportunities drive individuals and communities to engage in activities that harm biodiversity. Illegal activities like poaching, logging, and illegal fishing may provide a source of income or food for people who lack viable alternatives. The need to meet basic needs can lead to the overexploitation of natural resources and the degradation of ecosystems (Nwani et al., 2020).
2. **Weak Law Enforcement and Governance:** Inadequate enforcement of environmental laws, corruption, and weak governance contribute to crimes against biodiversity in Nigeria. Insufficient resources, limited capacity, and a lack of coordination among law enforcement agencies hinder the effective prevention, detection, and prosecution of offenders. This creates an environment conducive to illegal activities (Ajibola, 2020).
3. **Demand for Wildlife and Natural Resources:** Domestic and international demand for wildlife products, timber, and other natural resources fuels crimes against biodiversity in Nigeria. The global market for illegal wildlife products, traditional medicines, exotic pets, and timber creates economic incentives for poachers, smugglers, and illegal loggers (Chukwuma et al., 2019; Ogogo et al., 2020).
4. **Lack of Public Awareness and Environmental Education:** Limited awareness and understanding of the value of biodiversity and its conservation contribute to crimes against biodiversity. Inadequate environmental education and outreach programs hinder communities from recognizing the ecological significance of their natural resources and the adverse consequences of their depletion. Increasing public awareness is essential for fostering a culture of conservation (Adeyemo et al., 2020; Suleiman et al., 2021).
5. **Rapid Urbanization and Infrastructure Development:** Nigeria's rapid urbanization and infrastructure development result in the conversion of natural habitats and the fragmentation of ecosystems. The expansion of cities, roads, agricultural lands, and industrial zones often encroaches upon protected areas and wildlife habitats, leading to habitat destruction, loss of biodiversity, and increased human-wildlife conflicts. Balancing development with biodiversity conservation is crucial (Obioha et al., 2021).
6. **Conflict and Insecurity:** In regions affected by conflicts and insecurity, crimes against biodiversity often escalate. Armed groups, militias, and insurgents may exploit natural resources, engage in illegal wildlife trade, or resort to destructive practices for economic gain. This type of crime against biodiversity is common in the north east and west regions of Nigeria, presently ravaged by insecurity of all sorts, ranging from terrorism, insurgency, banditry, militia crimes, etc. The breakdown of law and order hinders the enforcement of environmental regulations, contributing to biodiversity loss (Nwani et al., 2020; Obioha et al., 2021).

Consequences of various crimes against biodiversity in Nigeria, particularly on sustainable development

There are various consequences of crimes against biodiversity in Nigeria, which can be discussed under this:

1. **Loss of Ecosystem Services:** Crimes against biodiversity in Nigeria, including illegal logging, habitat destruction, and pollution, lead to the degradation and loss of ecosystem services. Ecosystem services, including the provision of clean water, climate regulation, pollination, and soil fertility, are essential for sustainable development. The loss of these services has a negative impact on human well-being, food security, and livelihoods, hindering long-term sustainable development efforts (Aghede, 2004; Ezebilo et al., 2021).

2. **Threat to Food Security:** Biodiversity crimes, including illegal fishing and bushmeat hunting, contribute to the depletion of fish stocks and the decline of wildlife populations, thereby affecting food security in Nigeria. Overexploitation of fisheries reduces fish availability, which is a vital protein source for many communities. The loss of wildlife species disrupts ecosystems and traditional hunting practices, undermining food sources and the cultural heritage of local communities (Oladele et al., 2020).
3. **Economic Losses:** Crimes against biodiversity have significant economic implications for Nigeria. The illegal wildlife trade, for example, represents a substantial loss of potential revenue from sustainable wildlife tourism and conservation efforts. Illegal logging results in the loss of valuable timber resources and economic opportunities in the forestry sector. The overall economic losses resulting from biodiversity crimes hinder sustainable economic growth and development (Borokini, 2012; Suleiman et al., 2021).
4. **Disruption of Ecological Balance:** Crimes against biodiversity, including poaching, the introduction of invasive species, and habitat destruction, disrupt ecological balances in Nigeria. The loss of key species and disruption of food chains can lead to ecosystem imbalances, cascading effects on other species, and ecological instability. This can result in increased pest outbreaks, reduced pollination, altered nutrient cycles, and diminished resilience to environmental changes, ultimately affecting the sustainability of ecosystems and their services (Borokini, 2012; Ogunkunle et al., 2020).
5. **Health Risks:** Crimes against biodiversity can have direct and indirect health risks for communities in Nigeria. Illegal wildlife trade and bush meat hunting can facilitate the transmission of zoonotic diseases from wildlife to humans, as seen in the case of the COVID-19 pandemic and other infectious diseases. Pollution from illicit activities, such as oil spills and improper waste disposal, can contaminate water sources and degrade air quality, leading to health problems for local populations. Protecting biodiversity is essential for preventing disease outbreaks and safeguarding public health (Adeola et al., 2020; Adeoye et al., 2021).

Research Methodology

The study employed a descriptive research design with a survey type. This type of design allows the researcher to use a subset of a population as a sample to generalize beliefs and opinions (Kasunic, 2005). To generate data for the study, quantitative and qualitative methods, including structured questionnaires and content analysis, were employed. Structured questionnaires were generated using *esurveyspro.com*, a tool that facilitated the collection, analysis, and interpretation of quantitative data for the study. Purposive sampling technique was employed, based on the researcher's observation of various forms of crimes against biodiversity in some states in Nigeria.

The study setting is North Central Nigeria. North Central Nigeria is a region rich in biodiversity. The region is made up of six (6) states which include Benue, Nasarawa, Kogi, Plateau, Kwara, Niger and the Federal Capital Territory, F.C.T. The population of states in North Central is put at over 20 million with Benue having 6,141,300, Nasarawa (2,886,000), Kogi (4,466,800), Plateau (4,717,300), Niger (6,783,300), Kwara (3,551,000) and F.C.T (3,067,500). The zone is strategically situated in the middle belt region of the country, between the north and south, with large arable land, evergreen vegetation, and a diverse ecosystem, which has earned it the name Middle Belt. The North Central given its plurality and centrality has numerous security challenges including conflicts and crimes which affect biodiversity such as environmental pollution and degradation, wildlife crimes, poaching, logging, habitat destruction, bush meat trading among others which have adverse effect on Nigeria's biodiversity and sustainable development hence, the need to investigate which crimes are prevalent in the region.

Results

Table 1: The Socio-demographic data of respondents

STATE OF RESIDENCE	FREQUENCY	PERCENTAGE (%)
BENUE	137	73.26%
NASARAWA	16	8.56%
PLATEAU	10	5.35%
NIGER	4	2.14%
KWARA	3	1.60%
KOGI	0	0.00%
FCT	17	9.09%
UNDECIDED	30	15.69%
TOTAL	217	100.0
GENDER		
MALE	123	65.78%
FEMALE	64	34.22%
UNDECIDED	30	15.69%
TOTAL	217	100.0
AGE		
18-30	108	58.06%
31-43	57	30.65%
44-56	21	11.29%
57 & ABOVE	0	0.00%
UNDECIDED	31	15.19%
TOTAL	217	100.0
MARITAL STATUS		
SINGLE	120	65.22%
MARRIED	63	34.24%
DIVORCED/SEPARATED	1	0.54%
WIDOWED/WIDOWER	0	0.00%
UNDECIDED	33	14.26%
TOTAL	217	100.0
EDUCATIONAL ATTAINMENT		
NO FORMAL EDUCATION	0	0.00%
PRIMARY	3	1.60%
SECONDARY	18	9.63%
TERTIARY	171	91.44%
UNDECIDED	25	18.83%
TOTAL	217	100.0
OCCUPATION		
SECURITY PERSONNEL	7	3.74%
FARMING	10	5.35%
CIVIL SERVICE	21	11.23%
ACADEMIA	92	49.20%
OTHERS	58	31.02%
UNDECIDED	29	16.23%
TOTAL	217	100.0

Table 1 presents the socio-demographic characteristics of the respondents. In terms of state of residence, Benue has 137 (73.26%) respondents, Nasarawa 16 (8.56%), Plateau 10 (5.35%), Niger 4 (2.14%), Kwara 3 (1.60%), Kogi 0 (0.00%), F.C.T 17 (15.69%) and those that did not disclose their residence were 30 (15.69%) respondents—proving that more people responded on the subject matter from Benue, F.C.T, Nasarawa, Plateau, Niger and Kwara accordingly. Regarding gender status, the male respondents comprised 123 (65.78%), while

the female respondents were 64 (34.22%), and those who did not disclose their gender were 30 (15.69%). This indicates that a higher percentage of respondents were male, comprising 65.78%. In terms of age bracket of respondents based on the percentage distribution, 108 (58.06%) of the respondents were from age range of 18-30 years, 57(30.65%) of the respondents are from an age range of 31-43 years, 21(11.29%) of the respondents were from age range of 44-56 years, 0(0.00%) of the respondents are from an age range of 57 and above, and 31 (15.19%) did not disclose their age. This suggests that most respondents were adults capable of understanding and providing accurate information on the subject matter related to crimes against biodiversity in Nigeria.

On marital status; 120 (65.22%) of the respondents were single, 34.24 (34.24%) of the respondents were married, 1 (0.54%) of the respondents was divorced, 0(0.00%) of the respondents were widowed/widower and 33 (14.26%) of the respondents did not reveal their marital status. This indicates that the majority of respondents were unmarried. Moreover, based on the percentage distribution by educational qualification, 3 (1.60%) of the respondents have primary education, 18 (9.63%) have secondary education, and 171 (91.44%) have tertiary education. In comparison, 25 respondents (18.83%) were undecided about their educational status. The results indicate that most respondents demonstrated a high level of knowledge about the subject matter. According to occupation of respondents based on the percentage; 7(3.74%) of the respondents were security personnel, 10(5.35%) of the respondents were farmers, 21(11.23%) of the respondents were civil servants, 92(49.20%) of the respondents were from the academia, other profession had 58 (31.02%) of the respondents while those undecided on their profession were 29 (16.23%) respondents. Proving that, most respondents were in occupations where crimes against biodiversity affected their jobs.

Table 2: Nature/types of crimes against biodiversity in North Central Nigeria

S/NO	ITEM DESCRIPTION	SA	A	UD	D	SD
A.	Illegal Wildlife Trade	30 (17.86%)	69 (41.07%)	78 (60.04%)	36 (21.43%)	4(2.38%)
B.	Poaching and Bushmeat Hunting	44 (26.35%)	81 (48.50%)	63 (74.74%)	29 (17.37%)	0 (0.00%)
C.	Illegal Logging and Timber Trade	50 (29.94%)	61 (36.53%)	63 (75.08%)	42 (25.15%)	2 (1.20%)
D.	Habitat Destruction and Land Conversion	38 (22.62%)	76 (45.24%)	65 (73.44%)	40 (23.81%)	1 (0.60%)
E.	Pollution and Environmental Degradation	53 (31.55%)	76 (45.24%)	14 (27.12%)	26 (15.48%)	6 (3.57%)
F.	Illegal Fishing and Overexploitation	34 (20.36%)	62 (37.13%)	72 (65.40%)	42 (25.15%)	7 (4.19%)
G.	Invasive Species Introduction	18 (10.71%)	59 (35.12%)	108 (44.02%)	32 (19.05%)	2 (1.19%)

Table 2 presents respondents' views on the nature and types of crimes against biodiversity in North Central, Nigeria. Based on the percentage distribution of the nature and types, 30 (17.86%) of the respondents strongly agreed that illegal wildlife trade was a crime against biodiversity, 69 (41.07%) also agreed, 78 (47.37%) were undecided, and 36 (21.43%) disagreed. In comparison, four respondents (2.38%) strongly disagreed with the matter. This entails that most respondents considered illegal wildlife trade a common crime against biodiversity in North Central Nigeria. Regarding whether poaching and bushmeat hunting constitute another type of crime against biodiversity, 44 respondents (26.35%) strongly agreed,

81 (48.50%) also agreed, 63 (37.74%) were undecided, and 29 (17.37%) disagreed. This suggests that the majority of the respondents also see poaching and bush meat hunting as another common crime against biodiversity in North Central, Nigeria.

Also, on illegal logging and timber trade as another type of crime against biodiversity, 50 (29.94%) of the respondents strongly agreed, 61 (36.53%) agreed, 63 (75.08%) were undecided, 42 (25.15%) disagreed while 2 (1.20%) of the respondents strongly disagreed. This indicates that the majority of respondents view logging and timber trading as another common form of crime against biodiversity in North Central, Nigeria. Moreover, 38 (22.62%) of the respondents strongly agreed that habitat destruction and land conversion are another form of crime against biodiversity in North Central, Nigeria. Additionally, 76 (45.24%) agreed, 65 (73.44%) were undecided, and 40 (23.83%) disagreed. In comparison, one (1) respondent (0.60%) strongly disagreed. This suggests that the majority of respondents view habitat destruction and land conversion as another form of crime against biodiversity in North and Central Nigeria.

Furthermore, 53 (31.55%) of the respondents strongly agreed that pollution and environmental degradation are another form of crime against biodiversity in North Central, Nigeria; 76 (45.24%) also agreed, 14 (27.12%) were undecided, and 26 (15.48%) disagreed. In comparison, six respondents (3.57%) strongly disagreed. This indicates that the majority of respondents view pollution and environmental degradation as another form of crime against biodiversity in North and Central Nigeria.

Regarding illegal fishing and overexploitation, 34 (20.36%) of the respondents strongly agreed that it constitutes another form of crime against biodiversity in North Central, Nigeria. Additionally, 62 (37.13%) agreed, 72 (65.40%) were undecided, and 42 (25.15%) disagreed. In comparison, seven respondents (4.19%) strongly disagreed. This suggests that the majority of respondents view illegal fishing and overexploitation as another form of crime against biodiversity in North and Central Nigeria. In terms of whether invasive species constitute another form of crime against biodiversity, 18 (10.71%) of the respondents strongly agreed, 59 (35.12%) also agreed, 108 (44.02%) were undecided, 32 (19.05%) disagreed, while 2 (1.19%) of the respondents strongly disagreed. This suggests that the majority of respondents did not consider the introduction of invasive species a common type of crime against biodiversity in North and Central Nigeria.

Table 3: Causes of crimes against biodiversity in North Central, Nigeria

S/NO	ITEM DESCRIPTION	SA	A	UD	D	SD
A.	Poverty and Livelihood Pressures	76 (47.20%)	70 (43.48%)	58 (81.18%)	12 (7.45%)	1 (0.62%)
B.	Weak Law Enforcement and Governance	58 (36.02%)	85 (52.80%)	64 (73.57%)	9 (5.59%)	1 (0.62%)
C.	Demand for Wildlife and Natural Resources	27 (16.77%)	80 (49.69%)	78 (60.37%)	30 (18.63%)	2 (1.24%)
D.	Lack of Public Awareness and Environmental Education	48 (29.81%)	83 (51.55%)	66 (71.67%)	20 (12.42%)	1 (0.62%)
E.	Rapid Urbanization and Infrastructure Development	37 (22.98%)	76 (47.20%)	69 (45.28%)	30 (20.50%)	2 (1.24%)
F	Conflict and insecurity	52 (32.30%)	74 (45.96%)	68 (69.56%)	23 (14.29%)	1 (0.62%)

Table 3 sought respondents' views on the causes of crimes against biodiversity in North Central, Nigeria. Based on the percentage distribution, 76 respondents (47.20%) strongly

agreed that poverty and livelihood pressures were the primary causes of crime against biodiversity, 70 (43.48%) also agreed, 58 (35.90%) were undecided, and 12 (7.45%) disagreed. In comparison, one respondent (0.62%) strongly disagreed with the matter. As shown by the study, the majority of respondents considered poverty and livelihood pressures to be one of the causes of crime against biodiversity in North Central, Nigeria. Regarding whether weak law enforcement and governance is another push factor for crimes against biodiversity, 58 (36.02%) of the respondents strongly agreed, 85 (52.80%) also agreed, 64 (40.00%) were undecided, and 9 (5.59%) disagreed. In comparison, one respondent (0.62%) strongly disagreed. This indicates that the majority of respondents view weak law enforcement and governance as one of the primary causes of crime against biodiversity in North Central, Nigeria. Also, on demand for wildlife and natural resources as the causes of crime against biodiversity, 27 (16.77%) of the respondents strongly agreed, 80 (49.6%) agreed, 78 (60.37%) were undecided, 30 (18.63%) disagreed while 2 (1.24%) of the respondents strongly disagreed. This suggests that the majority of respondents did not consider demand for wildlife and natural resources as a significant factor contributing to biodiversity crime in North Central, Nigeria.

Moreover, 48 (29.81%) of the respondents strongly agreed that a lack of public awareness and environmental education is a significant cause of crime against biodiversity in North Central, Nigeria. Additionally, 83 (51.55%) agreed, 66 (41.67%) were undecided, and 20 (12.42%) disagreed. In comparison, one respondent (0.62%) strongly disagreed. This suggests that the majority of respondents believe a lack of public awareness and environmental education is a significant contributing factor to biodiversity crime in North Central, Nigeria. Furthermore, 37 (22.98%) of the respondents strongly agreed that rapid urbanization and infrastructure development are responsible causes for crime against biodiversity in North Central, Nigeria; 76 (47.20%) also agreed, 69 (45.28%) were undecided, and 30 (20.50%) disagreed. In comparison, two respondents (1.24%) strongly disagreed. This indicates that the majority of respondents believe rapid urbanization and infrastructure development are the primary causes of crime against biodiversity in North Central. On whether conflict and insecurity are a causative factor for crime against biodiversity, 52 (32.30%) of the respondents strongly agreed, 74 (45.96%) also agreed, 68 (69.56%) were undecided, 23 (14.29%) disagreed, while 1 (0.62%) of the respondents strongly disagreed. This indicates that the majority of respondents consider conflict and insecurity as primary causative factors for crimes against biodiversity in North and Central Nigeria.

Table 4: Consequences of various crimes against biodiversity in Nigeria, particularly on sustainable development

S/NO	ITEM DESCRIPTION	SA	A	UD	D	SD
A.	Loss of Ecosystem Services	51 (33.12%)	88 (57.14%)	72 (65.70%)	7 (4.55%)	0 (0.00%)
B.	Threat to Food Security	53 (34.42%)	75 (48.70%)	74 (63.63%)	14 (9.09%)	1 (0.65%)
C.	Economic Losses	56 (36.36%)	80 (51.95%)	73 (64.51%)	8 (5.19%)	0 (0.00%)
D.	Disruption of Ecological Balance	54 (35.06%)	83 (53.90%)	74 (63.63%)	6 (3.90%)	0 (0.00%)
E.	Lack of security presence in many areas	47 (30.52%)	80 (51.95%)	75 (62.27%)	14 (9.09%)	1 (0.65%)
F.	Health Risks	45 (29.22%)	84 (54.55%)	78 (60.37%)	10 (6.49%)	0 (0.00%)

Table 4 captures respondents' views on the consequences of crimes against biodiversity in North Central, Nigeria. Based on the percentage distribution, 51 (33.12%) of the respondents strongly agreed that the loss of ecosystem services was a consequence of crimes against biodiversity, 88 (57.14%) also agreed, and 72 (65.70%) were undecided. In comparison, 7 (4.55%) of the respondents strongly disagreed on the matter. As shown by the study, the majority of respondents considered the loss of ecosystem services as one of the consequences of crimes against biodiversity and sustainable development in North Central, Nigeria.

Regarding whether the threat to food security is another consequence of crimes against biodiversity, 53 respondents (34.42%) strongly agreed, 75 (48.70%) also agreed, 74 (48.70%) were undecided, and 14 (9.09%) disagreed. In comparison, one respondent (0.65%) strongly disagreed. This indicates that the majority of respondents viewed a threat to food security as one of the consequences of crimes against biodiversity, hindering sustainable development in North Central, Nigeria. Additionally, regarding the consequences of economic losses due to crime against biodiversity, 56 (36.36%) of the respondents strongly agreed, 80 (51.95%) agreed, 73 (64.51%) were undecided, while 8 (5.19%) disagreed. This indicates that the majority of respondents stated that economic losses were also consequences of crimes against biodiversity, thereby hampering sustainable development in North Central, Nigeria. Moreover, 54 (35.06%) of the respondents strongly agreed that the disruption of ecological balance had consequences, 54 (35.06%) also agreed, 83 (53.9%) were undecided, and 74 (63.63%) disagreed. This indicates that the majority of respondents stated that ecological balance is one of the consequences of crimes against biodiversity, which hinders sustainable development in North Central, Nigeria.

Furthermore, 47 (30.52%) of the respondents strongly agreed that the lack of security presence in many areas was a contributing factor to crimes against biodiversity. Additionally, 80 (51.95%) agreed, 75 (62.27%) were undecided, and 14 (9.09%) disagreed. In comparison, one respondent (0.65%) strongly disagreed. This indicates that the majority of respondents identified a lack of security presence in many areas as one of the consequences of crime against biodiversity, which affects sustainable development in North Central. Regarding whether health risks are a consequence of crimes against biodiversity, 45 respondents (29.22%) strongly agreed, 84 (54.55%) also agreed, 78 (51.11%) were undecided, while 10 (6.49%) disagreed. This suggests that the majority of respondents view health risks as consequences of crimes against biodiversity, thereby hindering sustainable development in North and Central Nigeria.

Table 5: Possible ways to reduce crimes against biodiversity for enhanced sustainable development in Nigeria

S/NO	ITEM DESCRIPTION	SA	A	UD	D	SD
A.	Strengthening Law Enforcement	83 (55.33%)	62 (41.33%)	70 (45.88%)	3 (2.00%)	0 (0.00%)
B.	Public Awareness and Education	84 (56.00%)	60 (40.00%)	69 (68.56%)	5 (3.33%)	0 (0.00%)
C.	International Cooperation	43 (28.67%)	83 (55.33%)	85 (55.65%)	4 (2.67%)	3 (2.00%)
D.	Community Engagement	65 (43.33%)	76 (50.67%)	72 (44.61%)	5 (3.33%)	0 (0.00%)
E.	Enhanced Monitoring and Research	69 (46.00%)	73 (48.67%)	72 (65.70%)	4 (2.67%)	0 (0.00%)

Table 5 ascertained respondents' views on possible ways to reduce crimes against biodiversity in North Central, Nigeria. Based on the percentage distribution, 83 (55.33%) of the respondents strongly agreed that strengthening law enforcement was the solution to crimes against biodiversity, 62 (41.33%) also agreed, 70 (45.88%) were undecided, while 3 (2.00%)

disagreed. As shown by the study, the majority of respondents considered strengthening law enforcement to address crimes against biodiversity, thereby enhancing sustainable development in North Central, Nigeria. Regarding whether public awareness and education are a solution to crimes against biodiversity, 84 respondents (56.00%) strongly agreed, 60 (40.00%) also agreed, 69 (45.56%) were undecided, and 5 (3.33%) disagreed. This indicates that the majority of respondents believe public awareness and education are key solutions to combating biodiversity crime for sustainable development in North Central, Nigeria.

Additionally, regarding international cooperation as a solution to crimes against biodiversity, 43 respondents (28.67%) strongly agreed, 83 (55.33%) agreed, 85 (55.65%) were undecided, 4 (2.67%) disagreed, and 3 (2.00%) strongly disagreed. This indicates that the majority of respondents emphasized the need for international cooperation as a solution to biodiversity crime in North Central, Nigeria. Moreover, 65 (43.33%) of the respondents strongly agreed that community engagement is the way to prevent crime against biodiversity, 76 (50.67%) also agreed, 72 (44.61%) were undecided, while 5 (3.33%) disagreed. This suggests that the majority of respondents believe community engagement is the most effective solution for combating biodiversity crime and promoting sustainable development in North Central, Nigeria. Furthermore, 69 (46.00%) of the respondents strongly agreed that enhanced monitoring and research were a remedy for crime against biodiversity, 73 (48.67%) also agreed, 72 (65.70%) were undecided, while 4 (2.67%) disagreed. This indicates that the majority of respondents recognized the need for enhanced monitoring and research as a means to address biodiversity crime and promote sustainable development in North Central, Nigeria.

Conclusion

The research article examines the nature and types of crimes against biodiversity in Nigeria to understand the causes of these crimes and assess their consequences, particularly on sustainable development. Findings from the study reveal that, to a very large extent, crimes against biodiversity have a largely negative impact on Nigeria's sustainable development. The most frequent types of crimes against biodiversity were pollution and environmental degradation, poaching and bushmeat hunting, illegal logging and timber trade, and habitat destruction and land conversion. The primary causes, according to the findings, were poverty, weak law enforcement and poor governance, a lack of public awareness and environmental education, the demand for wildlife and natural resources, and conflict and insecurity. The study revealed that crimes against biodiversity have significant consequences, including the loss of ecosystem services, disruption of ecological balance, economic losses, health risks, and threats to food security, thereby affecting sustainable development in Nigeria. The research study reveals that strengthening law enforcement, enhancing public awareness, promoting environmental education, improving monitoring and research, and fostering community engagement are necessary to curb crimes against biodiversity, thereby paving the way for sustainable development in Nigeria.

Recommendations

The research study, therefore, pushes forward the following recommendations:

1. There is a need to strengthen law enforcement across states in Nigeria to prevent, control, arrest, and ensure the speedy prosecution of individuals who commit crimes against biodiversity.
2. There is a need for increased public awareness and environmental education on the dangers posed by various crimes against biodiversity in Nigeria.
3. There should be enhanced monitoring of biodiversity crime-related issues and research in order to bring to the public's attention the various crimes that affect biodiversity and sustainable development in Nigeria.

4. There is a need for increased community engagement to curb crimes against biodiversity and promote sustainable development in Nigeria.

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