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BIODIVERSITY CONSERVATION IN NIGERIA; PROSPECTS AND CHALLENGES

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ABSTRACT

Timber harvesting with insufficient planning, improper operational techniques and lack of control of operations results in severe damage to conserving the forest, forest trees and everything present in it. Human play a very prominent role in a day to day environmental dynamics. Consequently, the effect of insufficient biodiversity conservation was identified. An illegal mining activity in the forest, illegal tree felling and indiscriminate hunting activities in the forest was discussed and their negative effect on the environment. The destruction of means of livelihood is worrisome as a result of uncoordinated activities of illegal artisan miners in the area. Strategies for effective environmental conservation need to be enforced like regulation of illegal mining and petroleum exploitation and also mass enlightenment of the public on environmental protection programs in virtually all the local government areas in the country. This paper's main goals are to draw attention to a few of these harmful behaviors that threaten biodiversity and to raise public awareness of the significance of biodiversity conservation measures in Nigeria.

Keywords: environmental dynamics, conservation, biodiversity.

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INTRODUCTION

The variety of living things and how they interact with one another—that is, life on Earth—is referred to as biodiversity. Animals, plants, and microorganisms are all related to diversity (Verma, A. K. 2018). Primarily, biodiversity is a cohesive view of biological diversity. Various other terms and ideas have been employed in the past to describe variety (Niss & Højgaard2019). Among these terms are taxonomic diversity (from the perspective of species diversity), ecological variety (from the perspective of ecosystem diversity), morphological diversity (from the perspective of genetic diversity), and functional diversity (this is from the perspective of the functions of the species). However, biodiversity offers a comparatively uniform viewpoint on the biological variations shown below.

- Genetic variability within a species
- Species variability within a community
- Species organization in an area into the various plant and animal communities

Genetic diversity: Each member of a species varies greatly from the others in terms of genetic composition due to the various gene combinations that can occur (Teixeira & Huber, 2021). A species' reproductive population needs this genetic diversity to stay healthy. Inbreeding between species will occur as a result of genetic type loss. This species ultimately leads to the extinction of that species by causing congenital defects. Breeding domestic plant and animal species

with wild variations may help increase productivity and resistance to illness, allowing for the diversity of nature's bounty (Banoub & de los Reyes, 2021). DNA manipulation is another tool used in modern biotechnology to improve pharmaceuticals, crops, and industrial raw materials.

The variety of ecosystems: The planet is home to a multitude of varied ecosystems. Distinct ecosystems include, for example, aquatic ecosystems like rivers, lakes, and oceans, as well as natural landscapes like forests, grasslands, deserts, mountains, and so forth (Pournou 2020). Urban fields, grazing grounds, and farm lands are all man-made areas. Overuse or abuse causes any ecosystem to lose productivity and deteriorate.

Species diversity: There are many different kinds of plants and animals in both natural and man-made environments. There is more species variety in some habitats, such tropical rainforests, than in others, as the ecology of deserts (Tejero-Cicuéndez & Rabosky 2022). On the world, 1.8 million species have been identified by scientists. This might just represent a tiny percentage of what is offered, though.

Nigeria is country rich in biodiversity, different natural ecosystems, and many people that live close to the environment. According to Biodiversity Conversation for Young Professionals (2011), maintained that Nigeria contains a few large patches of natural lowland and montane forests, important freshwater wetlands, savannas, high-altitude plateaus, mangroves, and coastal areas under various climatic conditions, resulting in an internationally recognized abundance of biodiversity. Unique primate species like the Cross River gorilla (Gorilla gorilla diehli), the drill (*Mandrillus leucophaeus*), and a number of smaller guenons are found only in Nigeria and adjacent forest areas. An extraordinary diversity of butterflies, amphibians, and other species has been tallied in Nigerian habitats. Many crop species also originated here, and a diversity of land races still exists in the country. Surrounding these remnant natural areas are villages, agricultural lands, and cities. As the most populous country in Africa, Nigeria faces extreme pressures on biodiversity and tropical forests that are mounting. Wildlife, trees, and many other plants are over harvested and poached, and the natural environment faces increased degradation from expanding unsustainable agriculture, water pollution, air pollution, and a variety of other anthropogenic factors. Desertification and climate change add to the stress. Lack of information about the present status of most habitats and species, about the actual extent of protected areas, and about other key data makes management difficult. Policymakers, managers, and technical staff at all levels need better information and further training to better fulfill their functions related to biodiversity and forest conservation and **management (Biodiversity Conversation for Young Professionals 2011)**

Importance of Biodiversity Conservation

Numerous social, financial, and environmental advantages are provided by forests. Apart from producing wood and paper goods, forests also support a great deal of biodiversity, offer recreational possibilities and habitat for wildlife, stop soil erosion and flooding, and contribute to clean air and water. Together, forest litters and soil microorganisms are a significant resource that helps to maintain tropical forests productive for arable farming (Akachukwu, 2006). Additionally, the forest's ecotourism potential is a potent tool for Nigeria's sustainable economic growth (Adeyemo and Okosodo, 2005; Akachukwu, 2005). Once more, woods serve as a vital barrier against climate change.

Forests create oxygen, which is essential for life, and absorb large amounts of carbon dioxide, the atmospheric gas mainly responsible for global warming. This process is known as photosynthesis. Forests can lessen the consequences of global warming by lowering the atmospheric concentration of

carbon dioxide (Mastrandrea *et al.*, 2009). The tropical rainforest is particularly abundant in species, and the future of these species affects a wide range of crops. Thousands of crops, including coffee, rubber, and mangoes, as well as new crops and livestock, grow wild in tropical woods. Approximately 65 of the 560 species of trees found in Nigeria are currently in danger of going extinct, while many more are at varying degrees of risk. (Adebobola and Imeht, 2001).

A vast variety of life species, including humans, are supported by biodiversity environments like soils, forests, and oceans. But according to Almond and Peterson (2020), people are the main cause of biodiversity loss because we have harmed vast areas of forests, contaminated the air and oceans, and contributed to the extinction of species. Researchers estimate that 80 percent of all wild animals and 60 percent of all plants have been destroyed as a result of human activities. The remaining bio diverse areas must be protected, and we must work to repair the ecosystems we have damaged. Earth can be saved by humanity if they move swiftly.

Certain species go extinct every year. With every extinct organism, the ecosystem's biodiversity declines. In 2020, hundreds of fish, frog, and orchid species were among the thousands of extinct species discovered by scientists and organizations (Kolby 2020). Biologists take the disappearance of a species very seriously; often, it takes decades for a species to be considered "extinct." Nevertheless, scientists often maintain a positive attitude because they do not want conservation efforts to suffer. That being said, biodiversity is being impacted by the fast extinction of species. When someone dies, it could start a chain of events that puts other people in danger.

Maintaining biodiversity benefits the economy by preserving jobs. A healthy ecology is necessary for forestry, tourism, and agriculture (Rac & Erjavec 2020). Consequently, companies that invest more in biodiversity may be able to generate more jobs. The International Labour Organization estimates that by 2030, the "green economy" might provide 24 million new jobs if nations adopt the required actions. In addition to improving economies, this would safeguard the environment.

There has been a significant surge in tourism due to increased awareness of biodiversity. Tour companies promote trips to less-traveled areas like forests and jungles, where visitors may go on river cruises, hikes, and observe and enjoy nature without endangering the ecosystem. (Stott & Hubart, 2020) The money made from ecotourism is invested back into the area, helping to preserve the diversity of plants and animals.

Agents of Conservation in Nigeria

Some governmental agencies like Nigerian conservation foundation (NCF), the federal environmental protection agency (FEPA), Forestry research institute of Nigeria (FRIN), the national resources council (NARECO) in collaboration with the united nations environmental programmes (UNEP) and the world wide fund (WWF) and several other agencies have embarked on programmes to protect and preserve the nations' biodiversity (Imeht and Adebobola 2001).

Prospects of Biodiversity Conservation in Nigeria

One of nature's most intricate and varied ecosystems is the forest. If proper management techniques are used, this feature enables the forest to sustainably provide a variety of commodities and services. The forest has an advantage for sustainability because its resources are renewable. If appropriate planning, management, and utilization regimes are implemented, the forest's resources might last forever. A life support system is comprised of the forest environment. "The last man dies when the last tree dies," it has been claimed. The forest is therefore a resource that man cannot live without. Without causing catastrophic effects like global warming, ocean surges, desertification, droughts, famines, ozone holes, and siltation of dams and rivers, he

cannot afford to destroy the forest. Over the course of a millennium, human evolution has been closely linked to the forest. As a result, forests are now a commonplace sight in many civilizations. The forest is associated with taboos and customary laws, but it also hosts a lot of social and spiritual events. The existence of sacred forests, such as the Igbo irunmole Forest, the Igbo Aiwo Forbidden Forest, the Igbo Orisa Forest, etc., indicates that there is a bond that man has developed with the forest that may be very difficult to break. Salami, (K.D *et al.*, 2018)

Threats to Biodiversity Conservation in Nigeria

Although biodiversity provides numerous advantages for sustainable development, human society paradoxically keeps undermining this important resource base, leading to significant losses in biodiversity and the extinction of entire species. (Swing-land, 2003).

The factors responsible for the biodiversity losses in Nigeria include the following: -

Population Pressure

In other parts of the world, biodiversity loss is an issue, especially in emerging nations where poverty is still rampant. Nigeria boasts one of the fastest rates of global population increase and is the most populated country in Africa. According to Worldometers, Nigeria's population was predicted to be 183, 523, 434 as of July 2015. This represents 2.51% of the world's total population, placing Nigeria as the seventh most populous country. Over 70% of Nigerians reside in rural areas, where their only sources of income are agriculture and other natural resources (FEPA, 1992). Although biodiversity helps to sustain the expanding populations in both rural and urban regions, overexploitation brought on by strong demand is putting more and more strain on the resource.

Climate Change

The release of greenhouse gases into the atmosphere by human activity, including carbon dioxide, methane, nitrous oxides, and others, is now widely acknowledged as the primary cause of the past 50 years' global warming. The average surface temperature of the planet has risen by roughly 0.6oC over the 20th century, according to the most current assessment report from the intergovernmental panel on climate change. The earth's atmosphere has warmed as a result of this slight increase in the mean temperature. An increase in sea level as a result of these rising temperatures could result in floods and the erosion of significant biological creatures, as demonstrated by the flood disaster in Ogunpa, Ibadan. Local weather patterns are frequently altered by climate change, upsetting processes and systems that support life and could have an impact on agricultural productivity. High temperatures, droughts, and evaporation are predicted by scientists to have detrimental effects on food security, water availability, and biodiversity loss. (UNESCO, 1999).

Socio-cultural characteristics, food and trade connections

As a set of practices or ways of doing things, cultures shape biodiversity through the direct selection of plants and animals and the reworking of whole landscapes (Sauer, 1965). Such landscapes have been described as anthropogenic nature, their composition, whether introduced species, agricultural monocultures or genetically modified crops, being a reflection of local cultures and a product of human history including the context in which individuals and groups live their lives (Milton, 2003).

Deforestation

Deforestation results from a mixture of economic, social and political causes that vary from site to site. The primary causes of deforestation in the tropics are logging and conversion to agriculture or grazing (Rowe *et al.*, 1992). Behind these causes are the driving forces such as policies attitudes and institution that influence production and consumption (Turner *et al.*, 1993). For Nigeria, the rate of deforestation due to poor land use planning has been alarming. Bisong (2002) reported that “Nigeria’s forests are threatened as the forest cover declines from

approximately 24 million hectares in 1975 to 15 million hectares in 1995 and down to 9.6 million hectares in 2011." This alarming rate of deforestation was caused by poor land use planning and has made habitat loss one of the most significant threats to biodiversity in Nigeria today.

Soil Erosion

Soils in Nigeria suffer deficiency common to the tropical soil such as low percentage organic matter and nitrogen, shallow dept and high acidity. About 63% of agricultural soils in Nigeria are low in productivity with over 90% being alfisols and ultisols which are low in organic matter with low activity clays (Lekwa and Whiteside 1996). about 35% of soils in eastern Nigeria are made up of acid soils with 63 to 93% sand in surface horizon, cation such as Ca, Mg and K are easily leached thereby causing Al and Mn toxicity which is prone to high infiltration, erosion and hence loss of useful soil micro flora and fauna. According to Lekwa and Whiteside (1996), in Agulu – Nanka gully erosion complex, of over 1,000 hectares of land have been lost to erosion. The severity of this erosion can be observed at Amucha gully erosion site, Hiepaug gullies in Plateau State and the Amkpa erosion site in Kogi State. Apart from the economic and social harm caused by these erosion sites, there is a great loss of biodiversity and malfunctioning of the ecosystem.

Soil erosion in Nigeria is caused by the following:

i. Increase population density and pressure on agricultural lands.
ii. Over grazing due to increased stocking rate.
iii. Wide spread deforestation due to reduced fallow period.
iv. Incompatible and unsustainable agricultural practices.
v. Increased use of fertilizers and other agro-chemicals.

As a result of soil erosion, siltation takes place in aquatic ecosystems which obstructs the flow of water. This affects the spawning grounds of fishes and fish migration and decreases net production of fish.

Table 1. Threatened Biodiversity Species in Nigeria

S/No.	Plant Species	Common name	Main uses	Status
1	*Milicia excelsa*	Iroko	Timber	Endangered
2	*Diospyros elliota*	Red fruited ebony	Timber	Endangered
3	*Triplochiton scleroxylon*	Obeche	Timber	Endangered
4	*Mansonia altisima*	Ofun	Timber	Endangered
5	*Masulania accuminata*		All purpose	Endangered
6	*Cordia milleni*	Omo	Timber	Endangered
7	*Erythrina Senegalensis*	Coral flower	Medicine	Endangered
8	*Cassia nigricans*	Black grain olive	Medicine	Endangered
9	*Nigelle sativa*	Black cumin	Medicine	Endangered
10	*Hymenocardia acida*	Large red heart	General	Endangered
11	*Kigelia africana*	Sausage tree	General	Endangered
12	Ceiba pentadra	Araba	Timber	Endangered

Source: Gbile ZO, Ola-Adams BA, and Soladoye MO. (2005)

CONCLUSIONS

Nigeria, blessed with lots of natural resource in plants and animals, there must be a conceited effort by the government and citizens to make wise use of these natural resources to avoid their degradation and depletion. Rapid population pressure, climate change, Socio-cultural characteristics, food and trade connections, and deforestation need to be seriously addressed by integrating environmental and developmental objective. These problems need to be seriously addressed and mental education and transformation of its citizenry on the importance of biodiversity need to be given utmost attention.

Recommendations

We cannot afford not to conserve our forests and thus lose the vital ingredients of rural development. The situation is getting worse every day and the need for forest conservation and restoration is becoming critical. In view of this, the under listed are hereby recommended towards achieving biodiversity save Nigeria:

i. There is need for us to observe national laws/plans and practices of local communities in forest management activities, and support the implementation of international biodiversity related agreements.
ii. Establish a forest management plan in which biodiversity conservation objectives are clearly and explicitly identified for each area of forest under management. Actual, potential and emerging threats to biodiversity must be anticipated and contingency plans prepared.
iii. In preparation of harvesting plans, pay particular attention to the local occurrence of species or habitats of special conservation concern and species that perform vital ecological functions using the expertise of biodiversity specialists during inventory. Use reduced impact logging that does not place important biodiversity features at risk.
iv. Raise public and political awareness on international/national laws and disseminate biodiversity information and strategies using various media. Improve the availability of information on biodiversity and transfer of knowledge and technology in libraries, reference collections, online databases and traditional knowledge. Encourage the creation of specialized courses and training activities in tropical forest taxonomy, ecology and biodiversity management.
v. Coordinate actions of forest owners, users and managers across landscapes to best ensure the maintenance of sufficient high quality connected habitat for species. Promote collaboration between research organizations and forest industry to develop silvicultural knowledge and practices. Develop and expand networks of field practitioners.

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