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REVIEW OF BIODIVERSITY LOSS AND ITS IMPLICATION ON FOOD SECURITY IN NIGERIA

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ABSTRACT

One of the countries sanctified with wide arrays biodiversity and natural-assets is Nigeria, which includes shrubbery, animals and microorganisms on which livelihood and food security of her citizens greatly depends. However, the rate at which these biodiversity and biological-assets are being reduced as a result of increased human actions is both national and global challenge that requires concerted effort and holistic approach. The valuables are gradually going into extinction. Thus, this paper reviews the evidence of loss of biodiversity in Nigeria from literatures, major causes of biodiversity loss in Nigeria which include increased human population, poverty, poor economic development, indefinite lawmaking and policies lying on biodiversity conservation, type of weather alteration, toxic waste, foray of creature from outer space species and other anthropogenic activities. The implications of biodiversity on foodstuff availability, ease of access, utilization and steadiness are the most important four domains of groceries safekeeping that are critically examined. Some of the unwholesome practices that endangered biodiversity are itemized and possible suggestions and recommendations are proffered. There is urgent need to sensitize and educate Nigerians on the implication of biodiversity loss on food security.

Keywords: Biodiversity; biological-assets, conservation; extinction; food security.

INTRODUCTION

The variety and variability of species that are required to play important roles in agro ecosystems for the support of food production and food security is known as biodiversity (FAO, 2014). The term "biodiversity" refers to the variety of species and subspecies of plants, animals, and microbes as well as the diversity of genetic resources utilized to produce goods such as food, fiber, fuel, and medicines. The combined outcome of many years of selection and innovative development by farmers, breeders, herders, and fishers is biodiversity as it relates to food security. It is the outcome of interactions between the environment, genetic resources, and management techniques by individuals from various cultures and origins. However, it is distressing to see how quickly species diversity, abundance, and circulation, particularly in the tropics and subtropics, are on the way out is alarming (Anwadike, 2020).

Food is a topmost concern in the global development agenda since it is crucial for the growth of people of all ages, including children and women who are pregnant. A country's progress in critical sectors is seriously hampered by a poor food basis. For human wellbeing and economic development, food security remains a fundamental concern (Ifeanacho and Okudu, 2020). According to reports, since 2009, the number of people who experience food insecurity and those who are undernourished has increased (FAO, 2014). Fawole et al. (2015) likewise discovered that the percentage of malnourished people increased between 2009 and 2014. Malnutrition frequently causes low birth weight, increased maternal mortality, lowered life expectancy, delayed maturation, decreased energy level, and growth failure. It can also affect cognitive function and learning capacity. Therefore, a country's investments in its health, education, and other development sectors may be compromised by malnutrition (Ifeanacho and Okudu, 2020).

Due to a number of variables, some of which are natural while most are artificial depending on the conditions in each country, food security in Africa, including Nigeria, is now seriously threatened (Fawole etal., 2015, Ogundipe et al., 2019). However, the loss of biodiversity is a key factor in the worldwide problems of food security. Therefore, this research examined the evidence of biodiversity loss and its effects on Nigeria's food security.

Loss of biodiversity in Nigeria

Several evidences of boss of biodiversity abound in the literatures over the years in western Africa (Chart 1) (THE TABLE HAD BEEN CHANGED TO CHARTS). Nigeria is home to 309 threatened species across a variety of taxonomic categories, including 18 species of reptiles, 13 species of amphibians, 60 species of fish, one species of Mollucs, 14 species of other invertebrates, 168 species of plants, birds with 19 species and mammals with 26 species (Chart 2) (Anwadike, 2020).

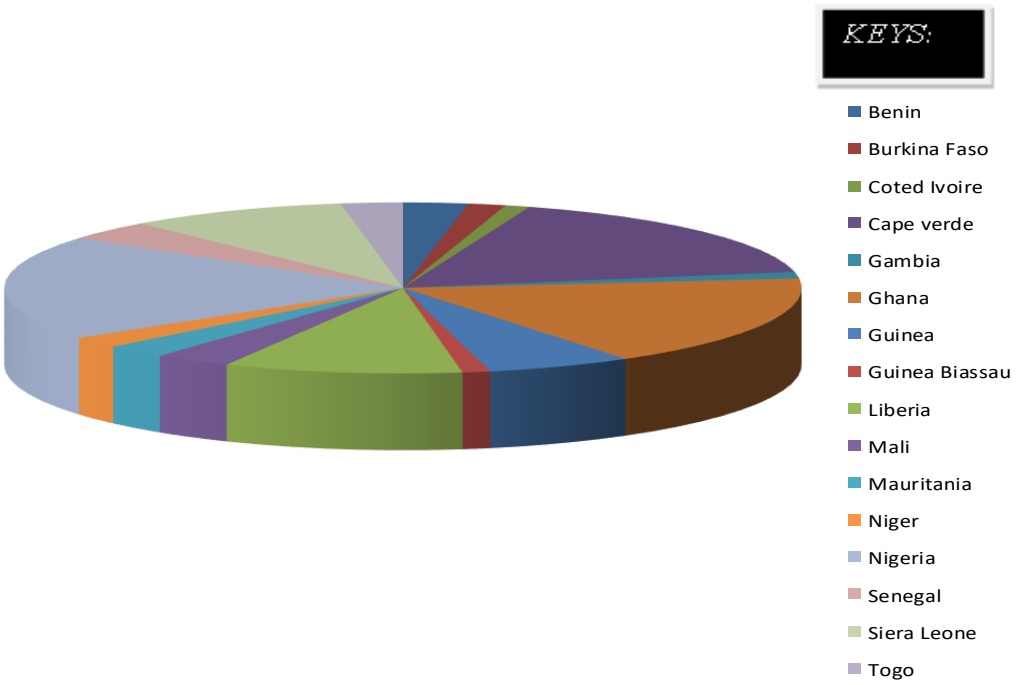

Chart 1: Report of Threatened species with their total occurrence in Western Africa
(Source: Anwadike, 2020)

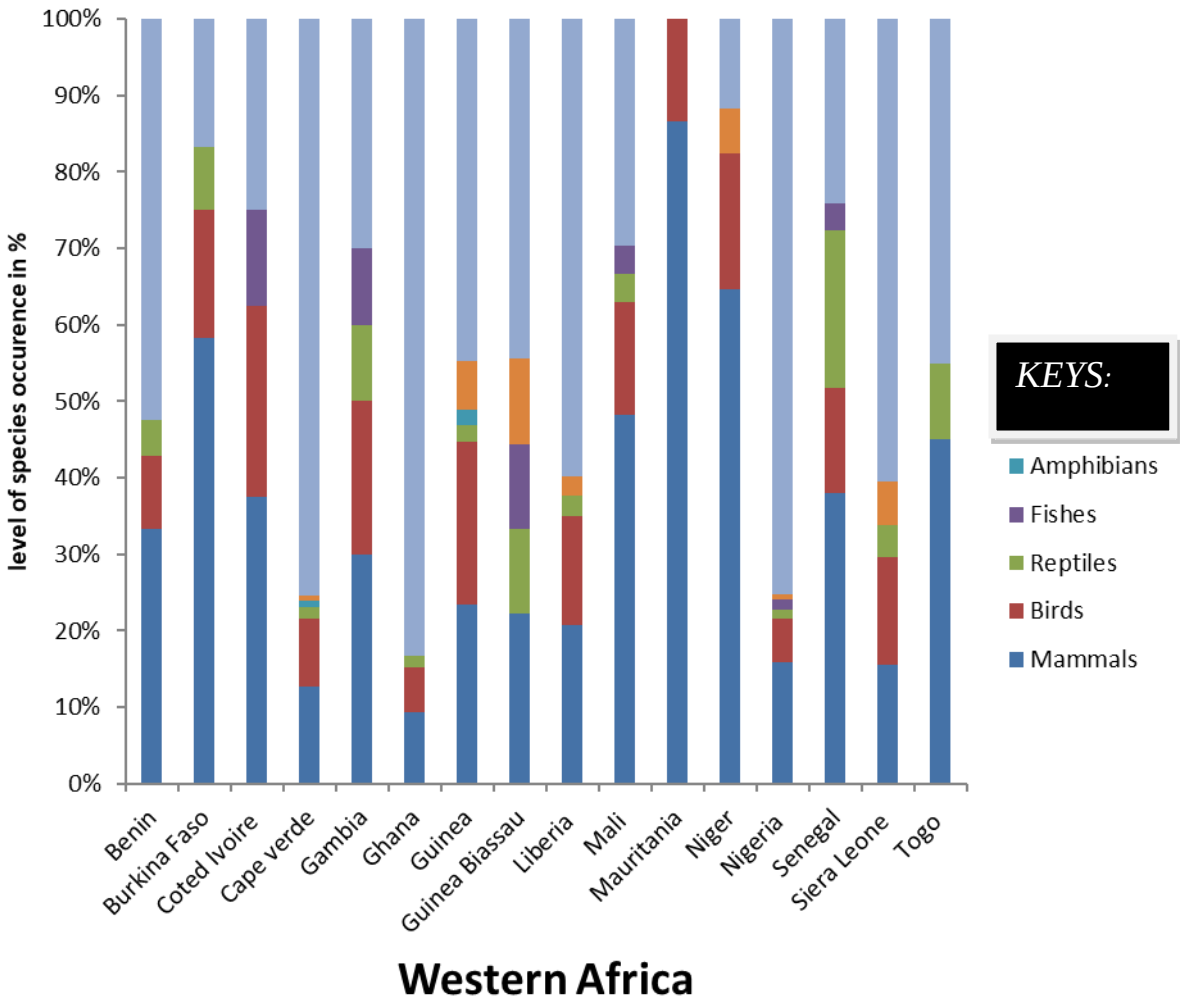

Chart 2: Kind of Species that pose threat to Human in each part of the country in Western Africa with their level of occurrence. (Source: Anwadike, 2020)

Major causes of loss of biodiversity in Nigeria.

Nigeria's socioeconomic structure is founded on its rich and diverse biological resources, which make up her natural richness. Unfortunately, Nigeria's biodiversity is seriously in danger of going extinct due to a number of factors, including climate change, economic growth, land use changes from agriculture, invasive species, pollution from oil exploration and exploitation, deforestation, desert encroachment, excessive hunting, the construction of roads and residential buildings, and the lackluster attitude of both the government and the general public toward the protection of biodiversity and the implementation of conservation measures (Ogundipe et al., 2019). Concisely, these factors could be summarized under the following sub-headings:

Biodiversity loss as a result of anthropogenic human being activities.

Human anthropogenic activities include over harvesting of resources mostly timber, burning, soil preparation for agriculture, over fishing, over hunting, excessive use of agrochemicals by farmers and non-farmers, deforestation due residential and road constructions and host of others. Over 21 million hectares of forest have been lost since 1970, according to a UNEP assessment from 2002. According to estimates, the desert is encroaching southwards at a rate of 0.6 km per year, and the northern states are more severely impacted than other states. According to reports, Sokoto's land area has decreased by roughly 11.43%. In Agulu-Nanka in

Anambra state and Imo state, gully erosion is a concern (Awadike, 2020). According to Akande et al. (2017), soil erosion has a negative impact on nearly all of Nigeria's 36 states, including the federal capital area, which results in the loss of important biodiversity.

Similarly, massive exploitation of Nigeria's forests, which are rich in biodiversity, including those in the states of Edo, Ondo, and Cross River for economic and development purposes has led to greater loss of biodiversity, including several beneficial soil micro and macro faunas and floras. This loss of biodiversity has also been exacerbated by overharvesting of plants, persistent or hazardous agrochemical use, and clearing and burning of forests. The second-most important ecosystem in Nigeria, the savannas, are also overexploited and depleted for their resources, including food, fuel wood, gold, and other minerals. The overexploitation and depletion of the savanna have resulted in a variety of negative effects, including the loss of vegetation cover, wildlife, soil organisms, and fertile top soil (Awosika and Folorunso, 2009, Muhammed, 2013).

Loss of biodiversity due to climate change

The changing climate in Nigeria is demonstrated by the increase in temperature, variable rainfall, and humidity, as well as the rise in sea level and flooding. Drought, desertification, and land degradation have also become more common. These have resulted in loss of biodiversity as evident from meteorological institutions spanning over long period. (Akande, *et al*. 2017). Several species of plants and other organisms are often destroyed during flooding. Also, there is indirect effect of climate change on biodiversity as there would be increase use of natural resources, migration to areas of high biodiversity and increased competition for water between people and wildlife (Ifeanacho and Okudu, 2020).

Loss of biodiversity due to poor implementation policies on biodiversity conservation

One of the biggest risks to biodiversity, according to Anwadike (2020), is the establishment of too many government bodies for environmental protection and conservation. He claimed that because these organizations don't cooperate, their stability functions are complicated. For instance, the forest guards might collude with loggers to selectively cut down trees for profit. As a result, several of the personalities tasked with conservation duties are likely impaired by administrative bottlenecks and collusion between operators and offenders.

Additionally, economic growth that necessitates regions for exploitation, mining, exploration, road expansion, and highway networks severely hinders conservation programs (Daura, 2000). Often times, the conservation projects are not sustainable due to inadequate funding of the project, poverty among local community, change of government policy and host of other factors. In addition, non-existence of national legislation on biodiversity and a lack of understanding of the value of various species of creatures are other major challenges to biodiversity conservation in Nigeria (Adebayo and Ugi, 2010, Akagu and Adeleke, 2012 and BDCP, 2015).

Loss of Biodiversity due to invasive species.

Several native and exotic species are encroaching on environments where they had never before existed. For instance, Nipa palm has replaced native plants in coastal mangrove swamps *(Nypa fructicans)*. Most of the water ways throughout the country, have been densely populated by water hyacinth *Eichoniacrassipes*, an exotic plant species. Similarly, *Chromolaenaodorata* and *Tithoniadiversifolia* are often the dominant plants in fallow farmland across southern and central part of the country.These have displaced the indigenous species in those area (Akagu and Adeleke, 2012, Akande *et al*, 2017). These have consequent effect on populations different species of animals that inhabit such ecosystems.

Implication of loss of biodiversity on food security in Nigeria.

A huge number of other species and the habitat in which they dwell have direct or indirect effects on food production. For example, the majority of significant crop species rely on animal pollinators. Numerous invertebrate and microbial species are crucial to the soil's fertility, which is what supports crops, animals, and vegetation. Many different species are important in keeping pests and parasites away from animals and plants that produce food.

Consequently, forest, savannah swampland, marine along with coastal ecosystem such as mangrove plants and animals offer a variety of services to agriculture and food production. Thus, loss in biodiversity has great implications on food security of a country (Isundar, 2011). Example of such services are regulation of water flow, improving air quality and binding of carbon. The ecosystems listed above also contribute to reduction of adverse effect of climate change as they provide habitats for species that support food supplies and provide The ecosystems mentioned above help mitigate the negative effects of climate change by housing species that maintain food supplies and by protecting people from

intense weather events like storm and floods (Ifeanacho and Okudu, 2020).

Furthermore, there are numerous connections between biodiversity and food security. For instance, food availability, accessibility, usage, and stability are the four main components of food security (FAO, 2020). Each of these dimensions is influenced by biodiversity. The distribution of sufficient amounts of a sufficiently wide variety of high-quality foods to satisfy human nutritional demands is what determines how readily available food is. Both domesticated and wild species have an impact on food production and supply. Recent genetic advancements have made it possible for food production to keep up with the rate of population growth in the world (Farooq and Azam 2002). However, continuous focus on intensive selection of a few species and breed with better economic traits may result in loss of genetic diversity (Isundar, 2011, Molotoks *et al*., 2017, FAO, 2018).

Food use describes the different ways that meals products are put together and processed to produce nutritious food for people and animals. The nutrient content of food differs between plant and animal species, as well as between varieties and breeds within species (FAO, 2018). Similar to this, a healthy and balanced diet depends on the food and other services offered by biodiversity. For example, a lot of people depend on their local environment to clean their water supply and provide them with wood for fuel. In some locations, animal excrement can be utilized to create cooking gas. Similar to this, microbes are essential for many food processing processes like creating cheese and bread. Additionally, microbes are important for food preservation. Also, microorganisms play significant role in food preservation. In order to increase everyone's access to food, biodiversity can also create sources of money that can be utilized to purchase food or reinvest in food production, storage, or processing. In a similar vein, biodiversity makes a significant contribution to the security of food supply. Various plant and animal species can provide food at various times of the year and in various environmental situations. Some species can adapt to threats and stresses including hot or dry weather, pest outbreaks, and disease outbreaks. When the production of cultivated plants and animals is disrupted, wild biodiversity frequently serves as a backup source of sustenance (FAO, 2020).

Emphatically, biodiversity affords human with an existence sustain structure that is necessary for the reutilization of vital components in ecosystems, the knowledge about biodiversity and its conservation is thus, a key factor in stimulating technological revolution and delivery of the necessary frame work for the expected sustainable development.

CONCLUSION AND RECOMMENDATION

In the light of the strong relationships that exist between biodiversity and food security and the challenges of biodiversity conservation in Nigeria, to prevent future degradation and depletion, there needs to be a coordinated effort made by everyone to use these natural resources wisely. There is need to address the problem of over abuse of resources, abject poverty with institutional and legal framework by integrating environmental and development objectives (Awadike, 2020). The issue of biodiversity loss and public awareness, mental training, as well as Nigerian citizen transformation on the value of biodiversity, need to be given the utmost priority. The importance of biodiversity for agriculture, food, food security, and nutrition has to be better understood. The following suggestions are made as a result of the urgent need to manage ecosystems, species, and genetic diversity sustainably at the production system level in order to improve food security. Improved producer access to the genetic resources they require is necessary to increase living standards.

Maintaining sustainable use of biodiversity in development strategies and outreach initiatives is necessary. Scientist breeders, producers, and other stakeholders should be encouraged to engage in active networking and knowledge exchange. There should be clarity of responsibilities among the conservation and environmental protection agencies. Conservation policies and laws should not be ambiguous and must be enforced as laws are better not made than to be made and not enforced.

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