AGRICULTURE AND BIODIVERSITY LOSS: A CASE STUDY OF WEPPA FARMS, AGENEBODE, EDO STATE, NIGERIA

Abstract

This chapter discussed agriculture and biodiversity loss: a case study of Weppa farms, Agenebode, Edo State, Nigeria. The aim of the study on agriculture and biodiversity loss in the case study of Weppa farms, Agenebode, Edo State, Nigeria, is to investigate and understand the relationship between agricultural practices and the loss of biodiversity in the farm. Weppa Farms is a prominent agricultural enterprise located in Agenebode, a town in the Etsako East Local Government Area of Edo State, Nigeria. The farm is renowned for its large-scale production and processing of various agricultural commodities, contributing significantly to the state's agricultural sector and it privately owned. The chapte revealed that the major drivers of biodiversity loss are habitat loss through deforestation, Land use change, herbicide and pesticide use in rice and oil palm plantations has negative impact on biodiversity. The chapter also showed that farm operations had negative impact on the fauna and flora in the study area.

Keywords: Agriculture, biodiversity loss, farm operations, major drivers Weppa farm

Authors

Okosodo E. F.
Department of Tourism Management Technology
Federal Polytechnic Ilaro
Ogu, Nigeria

Sarada P.M
Department of Botany
N.C Autonomous College
Jajpur, India

I. INTRODUCTION

II. AN OVERVIEW OF WEPPA FARMS, INCLUDING ITS LOCATION, SIZE, AND PRIMARY AGRICULTURAL ACTIVITIES

The Leventis Foundation is the 100% owner of Sunvit Agro-Industrial Company Limited, the operator of Weppa Farm. Since 2006 the Leventis Foundation, from its own resources, has invested significantly in Weppa Farm with the aim of developing a leading agricultural enterprise, focused on agricultural excellence, sustainability and the development of its people. The Leventis Foundation is keen to see agricultural development, rural employment, national food security and local processing of raw materials. Currently, all funds generated are re- invested into the development of Weppa Farm and once fully developed any surplus will be used to expand the operations of the farm schools Weppa Farm is a 13,000-hectare farm located near Agenebode, Etsako East local government area in Edo State, Nigeria and was acquired by the Leventis Foundation in 1999. Since 2006 the Foundation has invested significantly in the development of Weppa Farm with the aim of developing a leading agricultural enterprise, focused on agricultural excellence, sustainability and the development of its people. The Foundation is keen to see agricultural development, rural employment, national food security and local processing of raw materials. Currently, all funds generated are re-invested into the development of Weppa Farm and once fully developed any surplus will be used to expand the operations of the farm schools. Weppa farms also known as Leventis Foundation farm as is a privately owned farm with coordinates of 6° 41’ East and 7.02’ North is located in Weppa Agenebode in Edo state Nigeria, 5km western bank of River Niger. The farm is divided into two major parts, the arable farmland and cash crop unit The farmland is 6000 hectares, 5km bank of River Niger. The Ogbudu and Obe rivers form the northern boundaries of the farm. Small rivers run through the farm with the result the area is usually flooded during the wet season. Annual rainfall is between 1,500 and 2,000 millimeters (59 to 79 inches), with variations occurring from year to year. However, it's important to note that these figures are approximate averages and can vary based on the specific year and climate conditions. February and March are the driest months and the wettest months are July and September. The mean annual temperature is 30°C. The mean annual relative humidity is not below 25% in the driest months and 100% during the wet seasons. The soil is typical of alluvial soil varying from sandy (zero clay content through every intermediate type to clay 60% plus clay content. The most obvious natural resource of Leventis Foundation Farmland is the trees, varied because the zone is the transition between the high forest and savanna. Contemporary, climax conditions might be described as either southern moist Guinea savanna where drainage is good or peat swamp where it is impeded. A third zone is very obvious enough for the small tree Mytragyna intermis to be unique gallery forest along the banks of the rivers that are tributaries or sub tributaries to river Niger. Here, are found high forest trees such as Nauclea diderichii, Ceiba pentandra. The lower galleries are dominated by Petrocarpus santalinoides which are flooded in June to October. The woodland in the south of the farm which is 7000 hectares is *Daniella oliverii* woodland. Throughout this woodland can be found the locust bean *Parkia biglobosa, Lophira lanceolota, and Vitex donniana*. In certain areas in the woodland *Pterocarpus erinecous* is found mixed with Daniela oliveri in equal numbers (Ewers and Didham, 2006). Other savanna tree species include *Etanda africana*, typical of dry open areas, Pilostigma *thoningii* of degraded areas and the Borassus palm (Borasus aethiopium) as good indicator of seasonal wetlands. Also,

Kigelia africana, with its conspicuous hanging Crops cultivated in the are arable and cash crops .maize, rice, yam, cow pea, millet, sorghum and native beans .cash grown are oil palm, citrus species mango, cashew, Teak, Melina agborea and Irvingia gabolensis Animal husbandry unit was also established cows, sheep, Goats and poultry are reared within the farm The farm currently consists of 6,000 hectares of cleared land, an area of conserved woodland and previously uncleared land, which is now being cleared for cultivation. It is a mixed farm with plantations, arable and livestock operations together with integrated industrial processing operations. The farm currently employs over 1,700 peo

III. THE IMPORTANCE OF AGRICULTURE FOR FOOD SECURITY AND ECONOMIC DEVELOPMENT IN NIGERIA

Agriculture plays a crucial role in ensuring food security and driving economic development in Nigeria. Here is an overview of the importance of agriculture in these areas:

1. **Food Security:** Agriculture is the main source of food production in Nigeria, providing sustenance for the growing population. It contributes significantly to the country's food supply, ensuring that people have access to an adequate and nutritious diet. By cultivating various crops and engaging in livestock production, agriculture helps meet the dietary needs of the population and reduces dependence on food imports.

2. **Employment Generation:** Agriculture is a major source of employment in Nigeria, particularly in rural areas where the majority of the population resides. It provides income-generating opportunities for farmers, farm laborers, and those involved in the agricultural value chain such as processing, transportation, and marketing. By creating jobs, agriculture helps alleviate poverty, reduce unemployment rates, and enhance rural livelihoods.

3. **Economic Growth and GDP Contribution:** The agricultural sector contributes significantly to Nigeria's Gross Domestic Product (GDP). It serves as a key driver of economic growth, accounting for a significant portion of the country's non-oil revenue. Agriculture provides raw materials for agro-based industries, including food processing, textile manufacturing, and agrochemical production, which further contribute to economic development and diversification.

4. **Foreign Exchange Earnings:** Agriculture plays a vital role in earning foreign exchange through the export of agricultural products. Nigeria is known for commodities such as cocoa, rubber, palm oil, and cashew nuts, which are exported to international markets. By promoting agricultural exports, the country earns foreign exchange, strengthens its balance of payments, and supports overall economic stability.

5. **Rural Development:** Agriculture is closely linked to rural development in Nigeria. Investment in agriculture, including infrastructure development, irrigation systems, and improved farming practices, helps enhance productivity and living conditions in rural areas. It facilitates access to essential services such as education, healthcare, and transportation, leading to improved standards of living and reduced rural-urban

migration.Agriculture in Nigeria is also crucial for building climate resilience. By adopting sustainable farming practices, such as agroforestry, conservation agriculture, and water management techniques, farmers can mitigate the impact of climate change and protect their livelihoods. Diversifying agricultural practices and promoting resilient crop varieties help farmers adapt to changing climatic conditions, ensuring long-term food security.Agriculture provides a source of income for farmers and individuals engaged in agricultural activities. Small-scale farmers, who form the majority in Nigeria, rely on agriculture as their primary livelihood. By increasing agricultural productivity and profitability, farmers can generate income, improve their living standards, and contribute to poverty reduction efforts. Agriculture serves as a reliable source of raw materials for various industries in Nigeria. The sector provides inputs for food processing, textile manufacturing, pharmaceuticals, cosmetics, and other value-added industries. By ensuring a steady supply of raw materials, agriculture supports industrial development, job creation, and the growth of the manufacturing sector.

Agriculture drives the development of rural infrastructure in Nigeria. Investment in agriculture often involves the construction of roads, irrigation systems, storage facilities, and agro- processing units in rural areas. These infrastructural developments not only facilitate agricultural activities but also create opportunities for other sectors to thrive, attracting investment and improving overall connectivity. Agriculture contributes to the development of food value chains, which include activities from production to consumption. By strengthening these value chains, farmers can efficiently move their produce from the farm to the market, reducing post-harvest losses and ensuring a steady supply of food. The development of storage, transportation, and processing facilities along the value chain improves food quality, reduces waste, and enhances market access for farmers. The agricultural sector in Nigeria benefits from technology and innovation, leading to increased productivity and efficiency. The adoption of modern farming techniques, improved seeds, precision agriculture, and mechanization helps farmers optimize their yields. Additionally, advancements in agricultural research and development lead to the development of resilient crop varieties, pest and disease management strategies, and improved agricultural practices, all of which contribute to enhanced food security and economic growth. Agriculture provides an avenue for diversifying Nigeria's export portfolio. By promoting the export of agricultural commodities, the country can reduce its dependence on oil revenue and increase its foreign exchange earnings. Diversification of exports creates a more resilient economy, reduces vulnerability to external shocks, and contributes to a more balanced trade profile. In conclusion, agriculture plays a vital role in ensuring food security, promoting economic development, reducing poverty, and fostering rural development in Nigeria. By prioritize. Given the vast agricultural potential in Nigeria, prioritizing and investing in the sector can significantly contribute to the nation's food security, economic growth, poverty reduction, and overall development.

IV. ASSESSING THE MAIN DRIVERS OF BIODIVERSITY LOSS ON WEPPA FARMS, METHODOLOGY EMPLOYED

Both the farm land and the Conserved woodland were examined to know the farm operations that is going in the area. Data was gathered by direct observational method (Okosodo and Sarada 2022) was used. Data was collected on the following farm operations

Bush clearing, ploughing, herbicide, pesticide, fertilizer application were the farm operations investigated After each farm operations the researcher carefully find how such operation affect biodiversity in the study site. Data was collected in two farming seasons and field study started in early May 2021 and 2022. Birds were sampled using a combination of point and line transects counts for patch-scale ecological investigations of terrestrial birds (Bibby et al., 2010). Five line transects, each at least 500 meters long (depending on the extent of the farm), were laid for each farm, with point stations spaced at various intervals of 100 meters. Each point station's bird activity was tracked for ten minutes. The survey was conducted three times a day, from 8:00 am to 10:00 am in the morning, from 12:00 pm to 2:00 pm in the afternoon, and from 4:00 pm to 6:00 pm in the evening, for a total of six hours. Additionally, all bird species seen in the sites and the area around them were recognized and documented

1. Empirical Data and Case Studies Highlighting Specific Examples of Biodiversity Loss on Weppa Farms

Table 1: Total number of flora and fauna species affected farm operations in the study area

Flora and fauna species Amphibians	Number of each species 7	Number affected 174
Avifauna	46	503
Fishes	14	87
Insects	61	210
Mammals	13	11
Plant species	76	191
Reptiles	6	161
Rodents	4	88

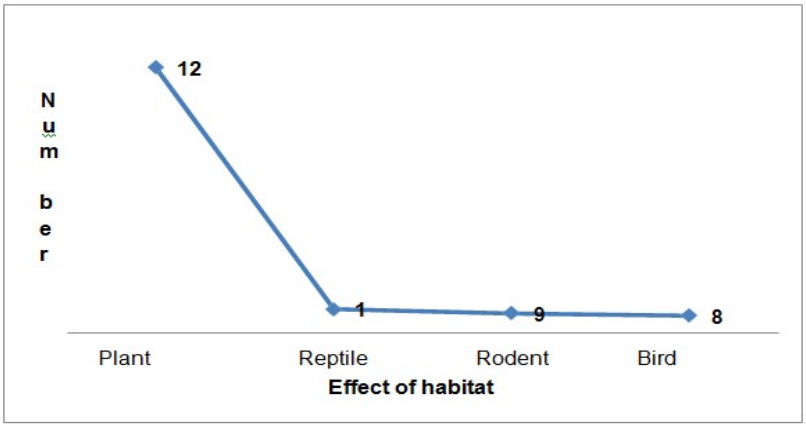

Figure 1: Effect of habitat loss on flora and fauna species in the study area

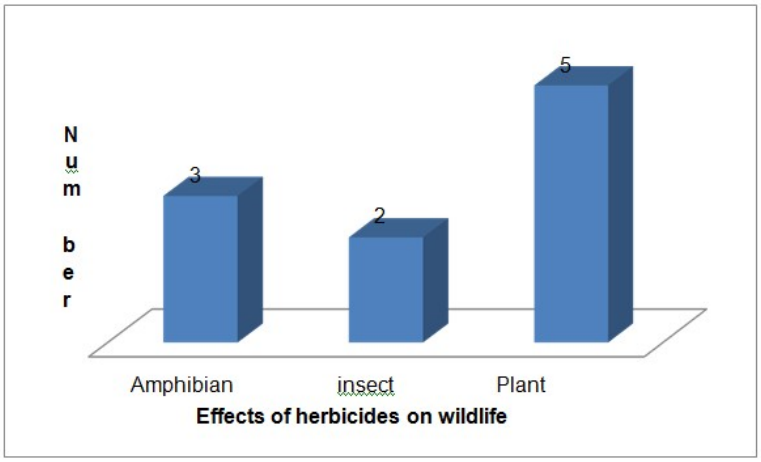

Figure 2: Effect of herbicide use on wildlife species in the study area

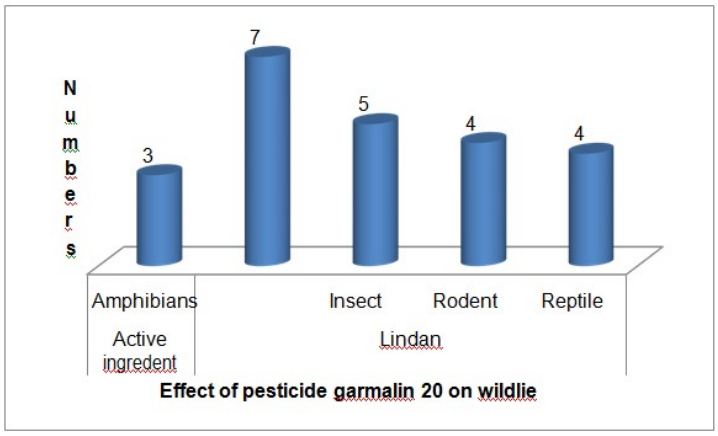

Figure 3: Effect of pesticide garmalin 20 on wildlife species in the study area

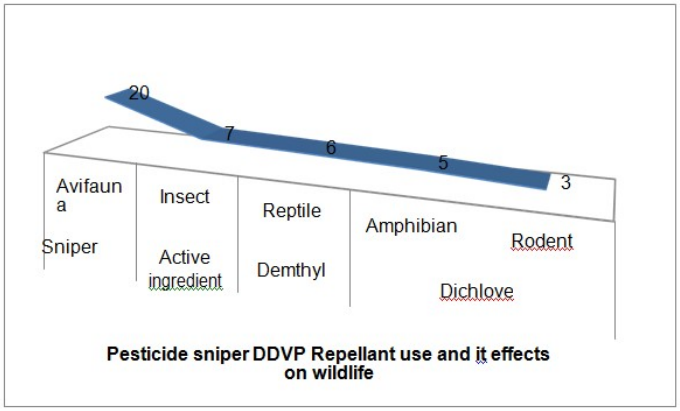

Figure 4: effect sniper DDVP as a repellant on wildlife species in the study area

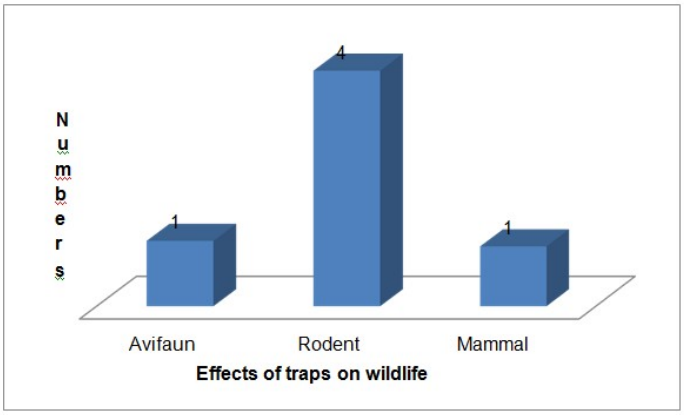

Figure 5: Effect of traps and killing with guns on wildlife species in the study area

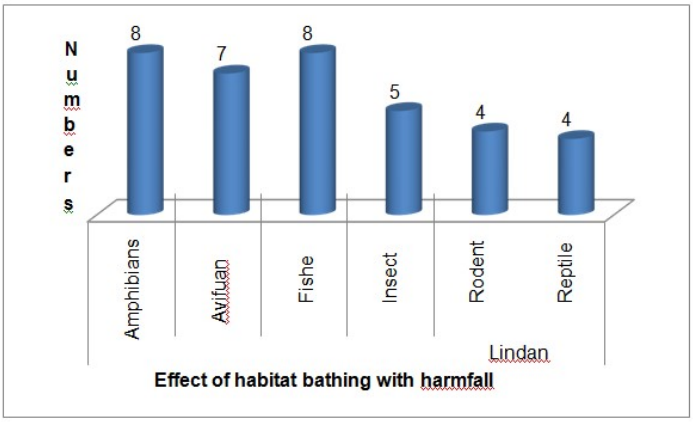

Figure 6: Effect of sniper and garmalin 20 for habitat bathing and streams poisoning on wildlife species

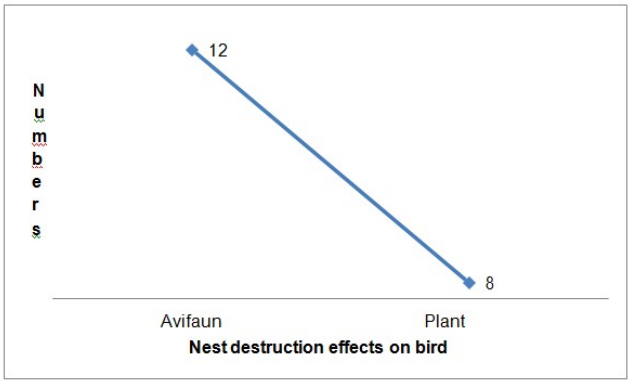

Figure 7: Effect of nest destruction on avifauna and flora species in the study area

V. THE IMPACTS OF BIODIVERSITY LOSS ON ECOSYSTEM SERVICES AND AGRICULTURAL PRODUCTIVITY

Biodiversity loss has significant impacts on ecosystem services and agricultural productivity. Here are some of the key effects. Biodiversity loss, particularly the decline of pollinators such as bees, butterflies, and birds, can disrupt pollination services. Pollinators play a crucial role in the reproduction of flowering plants, including many crops. Reduced pollination can lead to decreased crop yields and lower agricultural productivity .Biodiversity loss can disrupt natural predator-prey relationships. Many organisms, such as birds, bats, and insects, act as natural pest controllers by preying on agricultural pests. When biodiversity declines, the populations of pest predators decrease, leading to an increase in pest populations. This can result in higher pesticide use and greater crop damage. Biodiversity loss can impact nutrient cycling processes in ecosystems. Various organisms, including microbes, fungi, and invertebrates, are involved in breaking down organic matter and recycling nutrients. In agricultural systems, these processes contribute to maintaining soil fertility. Reduced biodiversity can disrupt these processes, leading to nutrient imbalances and decreased soil fertility, which in turn affects crop growth and productivity. Biodiversity ecosystems, such as wetlands and forests, play a vital role in regulating water quality and quantity. They act as natural filters, removing pollutants and excess nutrients from water bodies. Biodiversity loss can compromise this water purification capacity, leading to degraded water quality. Additionally, ecosystems help regulate water flow and prevent flooding by absorbing and storing water during periods of high rainfall. Loss of biodiversity can reduce these natural water regulation services, increasing the vulnerability of agricultural areas to floods or droughts. Biodiversity provides a vast array of genetic resources that can be utilized to develop new crop varieties with improved traits such as disease resistance, tolerance to environmental stresses, and higher yields. With biodiversity loss, the pool of genetic diversity available for crop breeding diminishes, reducing the potential for developing resilient and productive agricultural systems. The decline of biodiversity can have cascading effects on ecosystem services critical for agricultural productivity. Protecting and promoting biodiversity conservation efforts are crucial for sustainable agriculture and the long-term well-being of both ecosystems and human societies.

VI. HABITAT FRAGMENTATION AND BIODIVERSITY LOSS IN WEPPA FARM IN EDO STATE NIGERIA

Habitat fragmentation is a significant contributor to biodiversity loss in many regions, including Weppa, Edo State, Nigeria. Here's how habitat fragmentation can impact biodiversity in the area:

1. **Habitat Loss:** Fragmentation occurs when large, continuous habitats are divided into smaller, isolated patches. This division leads to the loss of overall habitat area, resulting in the displacement or extinction of certain species. As habitats become smaller and more isolated, they can no longer support the same number and diversity of species.

2. **Disruption of Species Movements:** Habitat fragmentation hinders the movement of species between fragmented patches. Many species require large areas to find mates, resources, or suitable habitats. When habitats are fragmented, populations become

isolated, which can lead to decreased genetic diversity and increase the risk of local extinctions.

3. **Edge Effects:** The creation of habitat edges, where fragmented patches meet, introduces new environmental conditions that differ from the interior of intact habitats. These edge effects can impact species that are adapted to specific habitat conditions. Edge species may be more vulnerable to predation, invasive species, exposure to pollutants, or other disturbances.

4. **Altered Species Composition:** Habitat fragmentation can change the composition of species in a fragmented landscape. Some species may be more tolerant of fragmented habitats and thrive in edge or disturbed areas, while others that are specialized or dependent on specific habitats may decline or disappear. This alteration in species composition can disrupt ecological interactions and lead to imbalanced ecosystems.

5. **Reduced Functional Connectivity:** Habitat fragmentation reduces the connectivity between habitats, making it challenging for species to disperse, find mates, and access resources. Reduced connectivity can limit gene flow, decrease population viability, and make species more susceptible to the negative effects of environmental changes, such as climate change.

6. **Decreased Ecosystem Services:** Biodiversity loss due to habitat fragmentation can result in a decline in ecosystem services. Pollination, seed dispersal, nutrient cycling, and pest control services provided by diverse species are compromised in fragmented habitats. This can have negative impacts on agricultural productivity, ecosystem stability, and human well-being.

VII. PESTICIDE USE AND BIODIVERSITY LOSS IN WEPPA FARM EDO STATE NIGERIA

The use of pesticides in Weppa Farm, Edo State, Nigeria, can have significant impacts on biodiversity, contributing to biodiversity loss. Here are some key points to consider regarding pesticide use and its effects on biodiversity. Direct Toxicity: Pesticides are designed to kill or control target pests, but they can also harm non-target organisms, including beneficial insects, birds, mammals, and aquatic organisms. The direct toxicity of pesticides can lead to mortality and population declines of non-target species, reducing biodiversity.Pesticides can harm beneficial organisms such as pollinators (e.g., bees, butterflies), natural enemies of pests (e.g., predatory insects), and soil organisms (e.g., earthworms). By reducing these beneficial organisms, pesticide use can disrupt ecological interactions, decrease pollination services, and result in increased pest populations, ultimately affecting biodiversity. Pesticides applied in agricultural fields can enter nearby water bodies through runoff or leaching. This runoff can contaminate streams, rivers, and ponds, causing adverse effects on aquatic organisms, such as fish, amphibians, and aquatic invertebrates. Pesticide contamination in water bodies can disrupt aquatic ecosystems and lead to biodiversity loss. Pesticides can bio accumulate and biomagnified in food chains. When organisms at lower trophic levels are exposed to pesticides, the concentration of pesticides can increase as they are consumed by higher trophic level organisms. This can result in significant impacts on predators and top predators, including birds and mammals,

which can experience negative effects on reproduction, behavior, and overall population health.Pesticides can have long-term effects on soil health and ecosystem functioning. They can reduce soil biodiversity, negatively impacting soil microorganisms, earthworms, and other beneficial soil organisms that contribute to nutrient cycling and soil fertility. Disruption of soil biodiversity can have cascading effects on ecosystem processes, ultimately affecting the overall biodiversity of the area. Prolonged and intensive pesticide use can lead to the development of pesticide resistance in target pests. As pests become resistant, higher pesticide doses or more potent pesticides may be required, leading to increased chemical inputs and potential negative impacts on non-target organisms and ecosystems.

VIII. HERBICIDE USE AND BIODIVERSITY LOSS IN WEPPA FARM EDO STATE NIGERIA

The use of herbicides in Weppa farm Edo State, Nigeria, can have significant impacts on biodiversity, contributing to biodiversity loss. Here are some key points to consider regarding herbicide use and its effects on biodiversity. Herbicides are designed to kill or suppress unwanted plants (weeds). However, they can also affect non-target plants, including native vegetation and crops. Herbicides can directly harm or kill non-target plants, leading to a loss of plant diversity and disrupting ecological relationships that rely on diverse plant communities. Herbicide use can result in the destruction of natural habitats and ecosystems. Native plants that provide habitat and food sources for various animal species may be affected or eliminated, leading to habitat loss and reduced biodiversity. This loss of habitat can have cascading effects on other organisms within the ecosystem. Herbicides can have detrimental effects on pollinators such as bees, butterflies, and other insects. These species rely on diverse plant communities for food and nesting resources. Herbicides that eliminate or reduce flowering plants can disrupt the availability of nectar and pollen sources, leading to declines in pollinator populations.

Herbicides can eliminate or reduce the availability of food sources for wildlife, including birds, mammals, and insects. Many species rely on specific plants or plant parts as their primary food source. The loss of these food sources can result in reduced abundance and diversity of wildlife.

Herbicides can enter water bodies through runoff or leaching, contaminating aquatic ecosystems. This contamination can harm aquatic plants, algae, and the organisms that depend on them, such as fish, amphibians, and invertebrates. Herbicide pollution in water bodies can disrupt aquatic ecosystems, leading to biodiversity loss.Herbicides can have long-lasting effects on soil health by depleting soil nutrients and disrupting the microbial communities. Soil microorganisms play vital roles in nutrient cycling, organic matter decomposition, and maintaining soil fertility. The disruption of these processes can affect the overall health and functioning of the soil ecosystem, indirectly impacting biodiversity. Frequent and intensive use of herbicides can lead to the development of herbicide-resistant weeds. These resistant weeds can proliferate and become more difficult to control, necessitating higher herbicide doses or the use of more potent herbicides. This cycle can have negative impacts on biodiversity as it disrupts natural plant communities and creates imbalances in ecosystems. To mitigate the negative impacts of herbicide use on biodiversity in Edo State and promote biodiversity conservation, the following measures can be

considered. Implementing integrated weed management practices that combine various weed control methods, including cultural practices, crop rotation, manual weeding, and targeted herbicide application when necessary

IX. LAND-USE CHANGES AND BIODIVERSITY LOSS IN WEPPA FARM IN EDO STATE NIGERIA

Land-use changes in Weppa Farm, Edo State, Nigeria, can have significant impacts on biodiversity, leading to biodiversity loss. Here are some key points to consider regarding land- use changes and their effects on biodiversity. Land-use changes such as deforestation and conversion of natural habitats into agricultural or urban areas can result in the loss of valuable habitats for many plant and animal species. Forests, wetlands, and other natural ecosystems are often rich in biodiversity, and their conversion to other land uses can lead to the displacement or extinction of species that depend on these habitats.Land-use changes can fragment continuous habitats into smaller, isolated patches. This fragmentation disrupts ecological connectivity and reduces the size of available habitats, leading to the loss of species that require larger territories or specific habitat conditions. Fragmented habitats are more susceptible to edge effects, invasive species, and other disturbances, further contributing to biodiversity loss.Changes in Species Composition: Land-use changes can alter the composition of species in an area. Native species that are specialized or dependent on specific habitats may decline or disappear, while generalist species that can tolerate or exploit modified landscapes may become dominant. This shift in species composition can result in reduced biodiversity and ecological imbalances.Land-use changes can impact the provision of ecosystem services essential for human well-being.

Conversion of natural habitats can reduce water regulation, soil fertility, carbon sequestration, and other services that support agriculture, climate regulation, and human livelihoods. The loss of these services can have cascading effects on local communities and ecosystems.Impact on Land-use changes can directly impact the livelihoods and cultures of indigenous and local communities who rely on the land and its resources. Changes in land use can disrupt traditional practices, access to resources, and cultural values associated with biodiversity, leading to social and economic challenges for these communities.Increased Invasive Species and Pest Incidence: Land-use changes can create conditions favorable for the establishment and spread of invasive species. Invasive species can outcompete native species, alter ecosystems, and threaten biodiversity. Changes in land use, such as the expansion of monocultures or the removal of natural vegetation, can also lead to increased pest incidence, further affecting biodiversity and agricultural productivity.

X. CONCLUSION AND RECOMMENDATIONS

According to the research study's findings, farming activities in Nigeria's Weppa farms rice fields and oil plantations pose a threat to biodiversity. Due to the damages that agricultural invaders have caused to their crops, these dangerous pesticides are used (avifauna and rodents). The study also demonstrated that wetland destruction affects aquatic species on an annual basis. Weppa staff and farmers in the community in the study sites need to receive training on the use of pesticides and herbicides and should avoid using dangerous pesticides. Increased land development for oil palm expansion resulted in habitat

loss that had a negative influence on biodiversity populations. The variety of the local avifauna can be preserved by prioritizing bird- friendly aesthetics while preserving native tree species in the forest. This will also increase the variety of native tree and bird species, which has enormous tourist potential for the state. To comply with international guidelines on the use of pesticides and herbicides. All levels of government should enforce the legislation regarding the use of pesticides. Since it appears that agricultural extension officers are no longer in use, the federal government has ordered the ministry of agriculture to reconsider using them to instruct these local farmers.

Wetland has to be conserved and preserved for nature more often. The best method to preserve biodiversity is to safeguard land from exploitation or conversion, So we must refrain from turning uninhabited areas into agricultural land. A chance to boost biodiversity exists when native ecosystems are restored on agricultural land that has been spared. Farmers must conduct farming in a way that is more biodiversity- and nature-friendly, using less inputs and switching from monoculture to polyculture agricultural methods. Blocks of unused forest compartments should be established within the palm plantations to provide breeding and protection areas for the mammals and avifauna in the area. The local residents in the Weppa should be allowed responsibity in the protection and management of the conserved woodland.

REFERENCES

[1] Adeleke, F. O. (2021). Impacts of Habitat Fragmentation on Mammal Communities, with Emphasis on Nigerian Primates.
[2] Chime AO, Osawaru ME, Ogwu MC, Ogunlowo EO (2015) Preservation of fresh tomato fruits(solanum lycopersicon L.) using leaf extracts of bitter melon (Momordica charantia L., Cucurbitaceae). J Phytopathol Plant Health 3:29–37
[3] Chime AO, Aiwansoba RO, Ogwu MC (2018) Pathological status of plant germplasm and sustainable crop production and conservation. J Energy Nat Resour Manag 1:17–21
[4] Enaregha EB, Izah SC, Okiriya Q (2021) Antibacterial properties of Tetrapleura tetraptera pod against some pathogens. Res Rev Insights 5:1–5. https://doi.org/10.15761/RRI.1000165
[5] Erinle KO, Ogwu MC, Evivie SE, Zaheer MS, Ogunyemi SO, Adeniran SO (2021) Impacts of COVID-19 on agriculture and food security in developing countries: potential mitigation strategies. CAB Rev 16(16):1–16
[6] Evivie, S.E., Ogwu, M.C., Ebabhamiegbebho, P.A., Abel, E.S., Imaren, J.O. and Igene, J.O. (2020).
[7] Packaging and the Nigerian food industry: challenges and opportunities. In: Food technology and culture in Africa. Ogunlade, C.A., Adeleke, K.M. and Oladejo, M.T. (eds). Reamsworth Publishing, Ibadan, Nigeria. 28 – 99pp
[8] Ikhajiagbe B, Ogwu MC, Ekhator PO, Omoayena II (2022b) Implications of soil nitrogen ehnacement on the yield performance of soybean (Glycine max) in cadmium-polluted soil. J Pollut Effects Control 10(2):1–12. #: 1000334. https://doi.org/10.1101/2021.11.22.469589 International Court of Justice (ICJ) (1986) Military and paramilitary activities in and against Nicaragua (Nicaragua v. United States of America). Merits, Judgment. I.C.J. Reports, 14

