

STRATEGIES FOR INVOLVING CROP FARMERS IN AGRICULTURAL BIODIVERSITY CONSERVATION IN OBUBRA LOCAL GOVERNMENT AREA, CROSS RIVER STATE NIGERIA

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Abstract

This study examined strategies for involving crop farmers in agricultural biodiversity conservation in Obubra Local Government Area, Cross River State, Nigeria. A multi-stage sampling technique was employed to select 126 crop farmers from 18 villages, and data were analyzed using descriptive statistics such as frequencies, percentages, and means. Findings revealed that most respondents were young (25–45 years), female (54.8%), and had secondary education as their highest qualification (36.5%). The major crops cultivated were cassava, yam, and maize. The primary reasons for agricultural biodiversity conservation included food (33.3%), medicinal purposes (21.4%), and industrial materials (10.3%). Major roles played by farmers in biodiversity conservation included crop rotation/intercropping (mean = 3.43), conservation of indigenous crop varieties (mean = 3.40), and agroforestry systems (mean = 3.35). Major challenges identified were lack of funds (mean = 3.32), poverty (mean = 3.02), and population growth (mean = 2.95). The study concludes that crop farmers play a significant role in biodiversity conservation through the adoption of sustainable agricultural practices, although their efforts are constrained by financial and institutional limitations. It recommends that government and development agencies should strengthen policy support, improve farmers' access to credit and extension services, and promote awareness on biodiversity conservation for sustainable agricultural development and environmental resilience in rural communities.

Keywords: *Biodiversity conservation, crop farmers, sustainable agriculture,*

Introduction

Biodiversity conservation is one of the most critical aspects of environmental sustainability that has attracted increasing global attention in recent decades. Biodiversity refers to the variety and variability of all living organisms plants, animals, and microorganisms on Earth, including their genetic diversity, species diversity, and the ecosystems they inhabit (Convention on Biological Diversity [CBD], 2022). It represents the foundation of life-support systems that sustain agriculture, food security, and human well-being. Biodiversity arises from the interaction between genetic resources and the management systems and practices adopted by people in different ecological settings (FAO, 2020).

In ecological terms, biodiversity encompasses the assemblage of plants, animals, and microorganisms, their genetic variability, populations, habitats, and ecosystems that together form a dynamic and interrelated landscape contributing to the richness of the natural environment (IPBES, 2019). Within agriculture, agricultural biodiversity often referred to as agrobiodiversity and includes the diversity of harvested crop varieties, livestock breeds, fish species, and non-domesticated wild resources found in fields, forests, rangelands, and aquatic ecosystems (FAO, 2021).

Agricultural biodiversity provides vital ecosystem services and livelihood benefits such as food, income, and resilience against climate and market shocks. It supports soil fertility, pollination, pest regulation, and genetic diversity for crop improvement (Ademola & Adepoju, 2022). According to the United Nations Environment Programme (UNEP, 2023), conserving biodiversity contributes significantly to food security, poverty reduction, and the

attainment of the Sustainable Development Goals (SDGs), particularly SDG 2 (Zero Hunger), SDG 13 (Climate Action), and SDG 15 (Life on Land).

The importance of biodiversity conservation extends well beyond food production. It provides raw materials for textiles, fuel, timber, and traditional medicine while supporting essential ecological processes such as nutrient and carbon cycling, soil formation, water purification, air quality regulation, and disease control (WWF, 2023). Moreover, biodiversity underpins cultural identity, recreation, tourism, scientific research, and education, offering both economic and non-material values that improve human well-being (UNDP, 2021).

Despite these benefits, biodiversity conservation faces numerous challenges at both global and local levels. In Nigeria, pressures from agricultural expansion, deforestation, unsustainable land use practices, population growth, and weak policy enforcement have led to rapid biodiversity loss (Nigerian Conservation Foundation [NCF], 2022). Although many rural farmers acknowledge the importance of biodiversity, they often lack adequate knowledge, institutional support, and incentives to adopt conservation-friendly practices (Saidu, 2017; Ezeaku et al., 2023).

Consequently, the level of farmers' participation in biodiversity conservation remains low, especially in rural areas. In Obubra Local Government Area of Cross River State, agricultural biodiversity is increasingly threatened by population pressure, poor land-use practices, and limited awareness among crop farmers. This situation undermines soil fertility, crop resilience, and the long-term sustainability of agricultural systems. Therefore, understanding and addressing the challenges that hinder farmers' involvement in biodiversity conservation are essential for sustaining agricultural productivity and promoting environmental stewardship.

In this regard, there is a pressing need to strengthen policies, institutions, and community-based strategies that encourage farmers' active participation in conservation practices. This study, therefore, focuses on strategies for involving crop farmers in agricultural biodiversity conservation in Obubra Local Government Area, Cross River State, Nigeria, with the ultimate aim of enhancing sustainable agricultural development and environmental resilience.

Objectives of the Study

1. examine the socio-economic characteristics of respondents in the study area
2. Identify the reasons for carrying out agricultural biodiversity conservation in the study area.
3. Identify the roles of crop farmers in agricultural biodiversity conservation in the study area.
4. Examine the challenges encountered in conservation biodiversity in the study area.

Materials and Methods

Study Area

The study was conducted in Obubra Local Government Area of Cross River State, Nigeria, located between latitudes 5°44'–6°17' N and longitudes 8°11'–8°33' E. It shares boundaries with Yala and Ikom to the north, Yakurr to the south, and Ebonyi State to the west. Obubra has about 98 villages grouped into 11 council wards. The people are predominantly farmers engaged in the cultivation of yam, cassava, and maize, as well as tree crops such as cocoa and oil palm.

Sampling Procedure and Sampling Size

A **multi-stage sampling technique** was employed for the study. In the first stage, **six (6) wards** were randomly selected from the eleven (11) wards in Obubra Local Government Area. The second stage involved the random selection of **three (3) villages** from each selected ward, making a total of **eighteen (18) villages**. In the third stage, **seven (7) crop**

farmers were randomly chosen from each village, giving a total sample size of **126 crop farmers**. Data collected were analyzed using **descriptive statistics** such as frequencies, percentages, and tables.

Results and Discussion

The distribution of respondents according to age as shown in Table 1.1 indicates that majority (40.5%) of the respondents were between 25-35 years, 39.7% were between 36-45 years, 15.9% were between 46-55 years while only 4.0% were aged 56 and above years. This result reveals that majority of the farmers were active since they are still young and agile.

The results show that the majority (54.8%) of the respondents were females, while 45.2% were males. This finding aligns with the report of **Adekoya and Oladokun (2022)**, who observed that women are more actively involved in managing crop diversity and local seed systems than men.

The results show that the majority (54.8%) of the respondents were females, while 45.2% were males. This indicates that women play a more active role in crop production and agricultural biodiversity conservation in the study area.

The results revealed that the majority (36.5%) of the respondents had **secondary education** as their highest educational attainment, followed by **primary education (27.8%)**, **tertiary education (19.8%)**, and **no formal education (15.9%)**. Similarly, **Okoye et al. (2021)** found that educational level significantly influences farmers' willingness to participate in environmental conservation programmes in southeastern Nigeria.

The results show that the majority (56.3%) of the respondents were **married**, followed by **single (27.0%)**, **divorced (12.7%)**, and **widowed (5.0%)**. This indicates that most of the respondents have family responsibilities and dependents to cater for. This finding agrees with the report of **Oluwatayo and Ojo (2018)**, who observed that married farmers tend to be more engaged in agricultural production because they rely on farming to meet family needs.

The results show that the majority (54.0%) of the respondents had a household size of **1–5 persons**, 34.1% had **6–10 persons**, while 11.9% had **11–15 persons**. This finding agrees with **Nwaobiala and Adesope (2020)**, who reported that small household sizes are common among smallholder farmers in southeastern Nigeria, affecting the amount of family labour available for farming operations.

The results show that the majority (62.7%) of the respondents were **non-members of agricultural associations**, while 37.3% were members. This indicates that most of the crop farmers in the study area do not belong to any formal farmer organization or cooperative society.

The results show that the majority (54.0%) of the respondents had **less than 5 years of farming experience**, 39.7% had between **5–10 years**, 5.6% had **11–15 years**, while only 8.0% had **above 15 years** of farming experience. This finding is consistent with **Agwu and Anyanwu (2020)**, who reported that short farming experience among rural farmers in South-Eastern Nigeria limits their understanding of sustainable land management practices.

Table 1.1 revealed that the majority (33.3%) of the respondents were **cassava farmers**, followed by **yam farmers (25.4%)**, **maize farmers (24.6%)**, while **16.7%** were engaged in the cultivation of other crops not listed in the questionnaire. This finding agrees with **Ezeh et al. (2020)**, who reported that cassava, yam, and maize are the predominant food crops cultivated by farmers in Cross River and neighboring states due to favorable climatic conditions and soil fertility.

1.1 Socio-Economic Characteristics of the Respondents

Variables	Frequency	Percentage (%)
Age		
25-35 years	51	40.5
36-45 years	50	39.7
46-55 years	20	15.9
Above 55 years	5	4.0
Total	126	100.0
Gender		
Female	69	54.8
Male	57	45.2
Total	126	100.0
Educational Level		
Non formal education	20	15.9
Primary education	35	27.8
Secondary education	46	36.5
Tertiary education	25	19.8
Total	126	100.0
Marital Status		
Single	34	27.0
Married	71	56.3
Divorced	16	12.7
Widowed	5	4.0
Total	126	100.0
Household size		
1-5	68	54.0
6-10	43	34.1
11-15	15	11.9
Total	126	100.0
Agric Association		
Member of Agricultural Association	47	37.3
Non Member of Agricultural Association	79	62.7
Total	126	100.0
Years of Farming		
Less than 5 years	68	54.0
5-10 years	50	39.7
11-15 years	7	5.6
Above 15 years	1	8
Total	126	100.0
Major Crop grown		
Cassava	42	33.3
Maize	31	24.6
Yam	32	25.4
Others	21	16.7
Total	126	100.0

Source: Field survey, 2021

Table 2.1 shows that the majority (33.3%) of the respondents conserved agricultural biodiversity **for food**, 21.4% **for medicinal purposes**, 10.3% **for industrial materials**, 7.9% **for ecosystem services**, 7.9% **for agricultural purposes**, 7.1% **for cultural values**, 4.8% **for aesthetic purposes**, 3.2% **for recreation**, 2.4% **for water recycling**, and 8.0% **for both environmental clean-up and reduction of climate change risks**. This result indicates that **food production remains the primary motivation** for conserving agricultural biodiversity among crop farmers in the study area. It further reveals that biodiversity plays a crucial role in reducing hunger and poverty among rural dwellers whose livelihoods depend mainly on farming.

This finding agrees with the **Food and Agriculture Organization (FAO, 2021)**, which emphasized that biodiversity for food and agriculture encompasses all living organisms that contribute to feeding human populations, maintaining ecosystem balance, and improving life quality.

Table 2.1: Distribution of respondents based on major reasons for practicing agricultural biodiversity conservation.

Major reasons for conservation Of agricultural biodiversity	Frequency	Percentage (%)
Food	42	33.3
Medicine	27	21.4
Industrial materials	13	10.3
Ecosystem service	10	7.9
Aesthetic	6	4.8
Agricultural purpose	10	7.9
Recreation	4	3.2
Cultural values	9	7.1
Water cycling	3	2.4
Environmental clean up	1	.8
Reduction of risk of climate Change	1	.8
Total	126	100.0

Source: Field survey 2021

Table 3.1 shows the distribution of respondents based on the **roles of crop farmers in biodiversity conservation**. The findings indicate that **crop rotation/intercropping** ranked first (mean = 3.43), followed by **conservation of indigenous crop varieties** (mean = 3.40),

agroforestry systems (mean = 3.35), **preservation of natural habitats** (mean = 2.75), **soil and water conservation** (mean = 2.70), **improved efficiency** (mean = 2.60), and **increased biodiversity awareness** (mean = 2.52). This result implies that crop farmers play vital roles in maintaining soil fertility, improving ecosystem health, and ensuring agricultural sustainability through the adoption of biodiversity-friendly practices. These findings align with **Pretty et al. (2018)** emphasized that farmers' on-farm management practices, such as mixed cropping and preservation of indigenous species, play a central role in improving ecosystem services and resilience.

Table 3.1: Distribution of respondents based on roles of crop farmers in biodiversity conservation

Roles of crop farmers in agriculture biodiversity conservation	SA	A	D	SD	STD	MEAN	RANK
conservation of indigenous crops varieties	54(42.1)	70(55.6)	3(2.4)	-	538	3.40	2 nd
Crop rotation/intercropping	57(45.2)	66(52.4)	3(2.4)	-	543	3.43	1 st
agroforestry systems	52(41.3)	67(53.2)	6(4.8)	1(8.0)	611	3.35	3 rd
preservation of natural habitats	14(11.1)	69(54.8)	41(32.5)	2(1.6)	666	2.75	4 th
soil and water conservation	9(7.1)	73(57.9)	41(32.5)	3(2.4)	636	2.70	5 th
Improving of Efficiency	14(11.1)	54(42.9)	52(41.3)	6(4.8)	749	2.60	6 th
Increase Biodiversity	7(5.6)	56(44.4)	58(46.0)	5(4.0)	666	3.40	7 th

Source: Field Survey, 2021; values in parenthesis ()=percentages. Key: SA-Strongly Agreed; A-Agreed; D-Disagree; SD- Strongly Disagree.

Challenges encountered when carrying out agricultural biodiversity conservation

Table 4.6: Shows distribution of respondents based on the challenges encountered when carrying out agricultural biodiversity conservation. This finding shows that Lack of funds ranked first (mean = 3.32); poverty ranked second (mean = 3.02); population growth ranked third (mean = 2.95); deforestation ranked fourth (mean = 2.67); climate change ranked fifth (mean = 2.46) and degradation ranked eight (mean = 2.52); invasive alien species ranked seventh (mean =2.46) and degradation ranked eight (mean = 2.45). This finding implies that crop farmers need enough funds in order to be involved in biodiversity. Chikare, (2016) noted that crop farmers are faced with the challenges of conserving biodiversity, continuous decrease in the ability to adequately provide for their needs.

Table 4.1: Distribution of Respondents Based on challenges encountered when carrying out agricultural biodiversity conservation.

Challenges Encountered when Carrying out Biodiversity Conservation	SA	A	D	SD	STD	Mean	Rank
Lack of funds	44(34.9)	79(62.7)	2(1.6)	1(8.0)	546	3.32	1 st
Population growth	27(21.4)	67(3.2)	31(24.6)	1(8.0)	703	2.95	3 rd
Poverty	29(23.0)	77(61.1)	14(11.1)	6(4.8)	732	3.02	2 nd
Climate change	13(10.3)	60(47.6)	47(37.3)	6(4.8)	733	2.63	5 th
Degradation	8(6.3)	50(39.7)	59(46.8)	9(7.1)	722	2.45	8 th
Deforestation	16(12.7)	54(42.9)	54(24.9)	2(1.6)	716	2.67	4 th
Invasive alien species	8(6.3)	50(39.7)	60(47.6)	8(6.3)	712	2.46	7 th
Desertification	15(11.9)	45(35.7)	57(45.2)	9(7.1)	797	2.52	6 th

Source: Field Survey (2021)

values in parenthesis () = percentages, Key: SA Strongly Agreed; A- Agreed; D- Disagree; SD- Strongly Disagreed

Conclusion

The study examined the strategies for involving crop farmers in agricultural biodiversity conservation in Obubra Local Government Area of Cross River State. Findings revealed that most of the respondents were young, active, and predominantly female, indicating that women play significant roles in managing and conserving local crop diversity. The majority of the farmers had formal education, which enhances their capacity to understand and adopt biodiversity-friendly practices.

The study also found that the major reasons for practicing agricultural biodiversity conservation were food security, medicinal use, and industrial materials. Crop farmers contribute significantly to biodiversity conservation through activities such as crop rotation, intercropping, conservation of indigenous crop varieties, and agroforestry practices. These roles align with the observations of Pretty et al. (2018), who emphasized that farmers' on-farm management practices form the foundation for ecosystem resilience and sustainable production systems.

However, challenges such as lack of funds, poverty, population pressure, deforestation, and climate change were identified as major constraints limiting farmers' active participation in conservation. These findings are consistent with those of Chikare (2016) and Ezeaku et al. (2023), who noted that inadequate financial and institutional support hampers rural farmers' conservation efforts in Nigeria.

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