

## Constraints to Agricultural Biodiversity Conservation by Farmers in Ikom Agricultural Zone, Cross Rivers State, Nigeria

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### Abstract

This study analyzed the constraints to agricultural biodiversity conservation faced by farmers in Ikom Agricultural Zone of Cross Rivers State, Nigeria. The objectives of the study were; to describe the socio- economic characteristics of cocoa farmers in the study area, ascertain the utilization of agricultural biodiversity conservation and analyze the constraints to agricultural biodiversity conservation in the study area. A multi- staged and random sampling procedures were adopted to select 180 respondents for the study. The results showed that 50% of the farmers were within the ages of 51 and 60 years, 83.3% of the respondents were males. Results further showed that majority (55.5%) of the respondents were married, 41.6% never proceeded to school after their first school leaving certificate and a greater proportion (52.7%) had farm sizes ranging between I and 6 hectares. More than half (55.6%) had farming experience above 20 years. Results further showed that 98.8% of the respondents' utilized the collection and preservation of seeds, 97.2% utilized afforestation, 94.4% utilized intercropping, bush fallowing and mulching, while 92.2% utilized agricultural- forestry. On the constraints to agricultural biodiversity conservation, increased demand for food and raw material leading to the over exploitation of agricultural biodiversity ranked 1st, with mean  $\bar{x} = 2.64$ , urbanization/population pressure on land ranked 2nd with mean  $\bar{x} = 2.53$ , ignorance of agricultural biodiversity conservation ranked 3rd with mean  $\bar{x} = 2.52$ . The study therefore recommended that farmers should be provided with incentives such as loans and credit and extension agents should enlighten farmers on agricultural biodiversity conservation techniques.

**Keywords:** Constraints, Agricultural biodiversity, Conservation, Farmers

### Introduction

Agricultural biodiversity consists of a variety and variability of animals, plants, and microorganisms that are used directly or indirectly for food and agriculture, including crops, forestry, livestock and fisheries. They comprise of the genetic resources (varieties and breeds) and species used for foods, fodder, fiber, fuel and pharmaceuticals

(Meduna *et al.*, 2021).

Agricultural biodiversity contributes to the provision of food and nutrition and sustainable food security is linked to improving the sustainable use, conservation and the enhancement of all genetic resources for food and agriculture (Dushyant and Mishra, 2011).

Agricultural biodiversity conservation as opined by Saidu (2017) is the planned management of natural resources or the total environment of a particular ecosystem to prevent exploitation, pollution, destruction or neglect and to ensure the future use of the resources and benefits such as food and medicine as well as a life support system (Dushyant and Mishra, 2011).

Agricultural biodiversity conservation is crucial for maintaining a healthy ecosystem, providing essential resources and preserving the natural beauty of the planet as well as ensuring that resources are not consumed faster than they are replaced. Conservation of agricultural biodiversity is of great concern due to the fast-growing population of the world and the adverse effect of changing climate on agriculture and genetic diversity.

According to the Food and Agricultural Organization of The United Nations (FAO) (2009). The factors which create a gap between the desired and actual farmers behavior in agricultural biodiversity conservation borders on knowledge, motivation, technology, types of incentives and disincentives, land use, population growth, poverty amongst others.

Conservation of agricultural biodiversity is often constraints by certain factors which Aboh and Effiong (2019), in their study on constraints to agricultural biodiversity conservation in Ukwa – West Local Government Area observed that farmers lack of interest and involvement in agricultural biodiversity conservation programmes include; inconsistent Government policies on agricultural biodiversity conservation, lack of motivation and incentives (loans and credits) amongst others.

Agricultural biodiversity yields many sustainable development benefits yet paradoxically, human society continues to undermine this valuable resource base,

instigating large scale losses and species extinction (Audu and Ayuba 2015). A desire for agricultural diversity conservation through investigating the constraints faced by farmers while trying to conserve them is the main reason for this research and it is against this backdrop that this research will address the following objectives:

1. describe the socio-economic characteristics of farmers in the study area?
2. ascertain the utilization of agricultural biodiversity techniques utilized in the study area?
3. analyze the constraints faced by farmers in conserving agricultural biodiversity in the study area?

### Materials and methods

This study was conducted in Ikom agricultural zone of Cross River State, Nigeria. The zone is made up of six extension blocks namely Ikom, Etung, Obubra, Boki, Yakurr and Abi. It is located in the central geopolitical zone of the state. Ikom agricultural zone has an estimated land mass of approximately 16,280.02km with a population density of 500 people per square kilometer with an estimated number of 942,416 people, Cross River State Geological Agency (CRSGA, 2010).

Ikom agricultural zone shares an international boundary with the republic of Cameroon in the East, Obudu and Obanliku in the North, Ebonyi state in the West and Biase Local Government Area in the South. It lies between longitude 8.00E and Latitude 520N and 62N (Abang, Solomon and Oko, 1994) The area is approximately 25m above sea level with an annual temperature range of 27C-33C, where rainfall range is between 1500mm-2000mm per annum. Ikom agricultural zone has two seasons, the rainy and dry season (CRSGA, 2010). The dominant vegetation of the area is primary and secondary forest, with some areas cleared for farming or timber extraction. The

other agricultural-ecological zone is the derived savannah. This study adopted a multi-staged and a simple random sampling technique to select respondents for the study. Stage one involved a simple random sampling of three extension blocks out of the six blocks that make up the zone and they include Etung, Ikom and Boki. Stage two sampling of three cells from each of the sampled blocks. From Etung block, Etomi, Ajassor and Bendeghe Ekiem were selected, Adijinkpor, Agborkim Mgbabor and Nkonfam were randomly sampled from Ikom block and Bashua, Boje and Okundi were randomly sampled from Boki block. Stage three involved the simple random of 20 respondents from the nine cells making a total sample size of 180 farmers used for the study. Descriptive statistics was used to analyze data collected from the field specifically, frequency count, standard deviation and ranking was used to analyze the data.

### Results and discussion

Table 2 shows the socio- economic characteristics of the respondents which include age, sex, marital status, educational level, farm size, farming experience etc. Socio-economic results show that 50% of respondents were within the age bracket of 50 and 60 implying that farmers were in their active age. This is necessary because farming requires energy. 83.3% of the farmers were males, 55.5 were married and only 16.6% of the farmers had no formal education. 52.7% of the farmers had farm sizes between 1 and 6 hectares, indicating they cultivated on small farm holdings. Results further showed that 56.6% of the farmers had farming experience of about 20 years and 44.4% had household size ranging between 6 and 10 people. Results further show that 27.7% of the farmers had an annual income of between 201,000 and 250,000 per annum indicating that farmers

in the study area earned high income from their farming activities. Among the farmers 66.6% had farming as their major source of income.

Results from Table 3 show the various agricultural biodiversity conservation techniques adopted by the farmers in the study area. Based on the results, 98% of the respondent practiced the collection and preservation of seeds while 97.2% practiced afforestation. Results further show that 94.4% practiced intercropping, bush fallowing and mulching. 92.2%, 86.1% and 83.3% practiced agricultural forestry, shifting cultivation mixed cropping and cover cropping respectively. This result is in line with the results of Aboh and Effiong (2019) who revealed that intercropping, use of cover crops, soil and water conservation and afforestation were adopted by farmers in Ukwa West Local Government Area of Akwa Ibom State. On the contrary, 1.1% ,2.7%, 5.5%and 16.6% of the farmers did not practice the collection and preservation of seeds, use of agricultural forestry, intercropping, bush fallowing and mulching respectively. Results also show that 11.1% and 16.6% practiced the imposition of traditional sanctions, establishment and preservation of secret grooves and planned grazing and browsing respectively. Also, 27.7%, 27.7%, 52.7%and 61.1% practiced organic farming, maintenance of rangeland, zero/minimum tillage and mixed farming respectively. These results are consistent with the findings of Camillus (2017) which showed that agricultural biodiversity techniques such as planned grazing and browsing, and maintenance of rangeland were practiced on a low extent while shifting cultivation, mixed farming, collection and preservation of seeds were practiced on a very high extent

Table 4 show the distribution of respondents based on the constraints encountered in agricultural biodiversity conservation in the

study area. It was observed that increased demand for food and raw materials leading to the overexploitation of agricultural biodiversity ranked 1st with mean ( $\bar{x}$  =2.64), urbanization and population pressure on land ranked 2nd with mean ( $\bar{x}$  =2.53), ignorance of agricultural biodiversity conservation ranked 3rd with mean( $\bar{x}$  =2.53), lack of interest and involvement of farmers in agricultural biodiversity conservation ranked 4th with mean( $\bar{x}$  =2.49),unfavorable land tenure system ranked 5th with mean( $\bar{x}$  =2.30), weak involvement of government and inconsistent government policies on agricultural biodiversity conservation ranked 6th and also climate change and land use changes ranked 6th with mean( $\bar{x}$  =2.02). These results show that the most serious constraints in agricultural biodiversity conservation in the study area include increased demand for food and raw materials leading to the overexploitation of agricultural biodiversity, followed by urbanization and population pressure on land, etc. These results imply that agricultural biodiversity is threatened by natural phenomenon which farmers cannot control. This view is confirmed by the Nigeria first biodiversity report 2001 which stated that with the increase in population and subsequent increase in demand for biological resources, natural habitats are being destroyed for plantation establishment, irrigation, food and livestock production, and non-timber forest resources.

### Conclusion

Based on the results, farmers in Ikom Agricultural zone utilized a variety of agro biodiversity conservation techniques but very few utilized the imposition of traditional sanctions, establishment and preservation of secret grooves, planned grazing and browsing, organic farming and zero/minimum tillage. Increased demand for

food and raw materials leading to over exploitation of agricultural biodiversity was ranked first as the constraint to biodiversity conservation therefore farmers cultivation of more foods and the education of farmers on agricultural biodiversity by extension agents will widen their knowledge and make them interested in agro biodiversity conservation.

### Recommendations

1. Farming in the study area is dominated by old people therefore young people should be encouraged to go into farming.
2. Farmers should be enlightened on complex agro biodiversity conservation techniques such as imposition of tradition sanctions and others so that they will equally utilize them.
3. Farmers should be enlightened on all agro biodiversity conservation techniques so that they can be practiced.

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Table 1: Distribution of sample size by blocks and cells

Agricultural zone	No of blocks	Sampled blocks	Number of cells	Total number of cells selected	Names of selected cells	Total number of farmers sampled
Ikom Agricultural Zone	6	Etung	9	3	Etomi	20
					Bendegheekiem	20
					Ajassor	20
		Ikom	11	3	Nkonfap	20
					Agborkimmgbabor	20
					Adijinkpor	20
						20
		Boki	10	3	Bashua	20
					Boje	20
					Okundi	20
Total		3	30	9	9	180

Source: Field Survey 2023.

Table 2: Socio-economic characteristics of the respondents

Variable	Frequency	Percentage
<b>Age(years)</b>		
Below 30	7	3.88
31-50	68	37.7
51-60	90	50
Above 60	15	8.3
Total	180	100
<b>Sex</b>		
Male	150	83.3
Female	30	16.6
<b>Marital Status</b>		
Single	50	27.7
Married	100	55.5
Widowed	10	5.5
Divorced	20	11.1
Total	180	100
<b>Educational Level</b>		
Non formal education	30	16.6
FSLC	75	41.6
SSCE	65	36.1
Tertiary edu.	10	5.5
Total	180	100
<b>Farm Size(Ha)</b>		
< 1 hectare	15	8.3
1-6	95	52.7
7-11	40	22.2
>11 hectares	30	16.6
Total	180	100
<b>Farming Experience</b>		
< 5 years	12	2.7
6-10	15	8.3
11-15	20	11.1
16-20	43	23.8
Above 20	90	50
Total	180	100
<b>House Hold Size</b>		
1-5	55	30.5
6-10	80	44.4
11-15	30	16.6
Above 15	15	8.3
Total	180	100
<b>Annual Income (000)</b>		
<150	10	5.5
150-200	30	16.6
201-250	50	27.7
Above 250	90	50
Total	180	100
<b>Major Source of Income</b>		
Farming	120	66.6
Trading	40	22.2
Civil service	20	11.1
Total	180	100

Source: Field Survey 2023.

Table 3: Utilization of agricultural biodiversity conservation techniques.

Agricultural Biodiversity Conservation Techniques	USE		NOT USE	
	Frequency	Percentage	Frequency	Percentage
Mixed cropping	150	83.3	30	16.6
Mixed farming	110	61.6	70	38.8
Organic farming	50	27.7	130	72.2
Planned grazing and browsing	30	16.6	150	83.3
Soil and water conservation	140	77.7	40	22.2
Shifting cultivation	155	86.1	25	13.8
Mulching	170	94.4	10	5.5
Cover cropping	150	83.3	30	16.6
Bush fallowing	170	94.4	10	5.5
Afforestation	175	97.2	5	2.7
Collection and preservation of seeds	178	98.8	2	1.1
Imposition of traditional sanctions	20	11.1	160	88.8
Establishment and preservation of secret grooves	30	16.6	150	83.3
Zero/minimum tillage	95	52.7	85	47.2
Agricultural forestry	166	92.2	14	7.7
Maintenance of rangeland	50	27.7	130	72.2
Application of manure	120	66.6	60	33.3
Intercropping	170	94.4	10	5.5

Source: field survey 2023

Table 4: Mean and Rank distribution of respondents constraints to the use of agricultural biodiversity conservation practices (n=180)



Constraints	VS	S	NS	Mean	SD	Rank
Urbanization/ population pressure on land	98(54.4)	79(43.9)	3(1.7)	2.53	.533	2 <sup>nd</sup>
Weak involvement of government and inconsistent government policies on agricultural biodiversity conservation	46(25.5)	91(50.6)	43(23.9)	2.02	.705	6 <sup>th</sup>
Inadequate capital/poverty	28(28.9)	91(50.6)	61(33.9)	1.82	.681	8 <sup>th</sup>
Climate change/land use changes	52(28.9)	80(44.4)	48(26.7)	2.02	.747	6 <sup>th</sup>
Ignorance of agricultural biodiversity conservation	106(58.9)	61(33.9)	13(7.2)	2.52	.630	3 <sup>rd</sup>
Increased demand for food and raw materials leading to over exploitation of agricultural biodiversity	120(66.7)	56(31.1)	4(2.2)	2.64	.525	1 <sup>st</sup>
Poor coordination of policies and legislations on agricultural biodiversity	44(24.4)	58(32.2)	78(43.3)	1.81	.804	9 <sup>th</sup>
Cultural and religious belief hinders biodiversity conservation	23(12.8)	98(54.4)	59(32.8)	1.80	.646	10 <sup>th</sup>
Lack of interest and involvement in agricultural biodiversity conservation	99(55.0)	71(39.4)	10(5.6)	2.49	.603	4 <sup>th</sup>
Unfavorable land tenure system	80(44.4)	74(41.1)	26(14.4)	2.30	.708	5 <sup>th</sup>
Deforestation/desertification	33(18.3)	92(51.1)	55(30.6)	1.88	.690	11 <sup>th</sup>

Source: Field Survey 2023

Key: VS=very serious S= serious, NS= not serious.

Figures in parenthesis= percentages.