EFFECTS OF SOCIAL AND ECONOMIC VARIABLES ON ADOPTION OF ECOLOGICAL MITIGATION STRATEGIES AMONG ARABLE CROP FARMERS IN ABAK AGRICULTURAL ZONE, AKWA IBOM STATE, NIGERIA

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https://doi.org/10.60787/AASD-v2i1-41

Abstract

The study is to analyze the effects of social and economic variables on adoption of ecological mitigation strategies among arable crop farmers in Abak agricultural zone, Akwa Ibom State. Specific objectives were to examine: the socio-economic and arable crop farmers; the effect of adaptation measures in controlling flood, and determine the constraints of adaptation measures among respondents in the study area. A Multi-stage random sampling procedure was used to select seventy (70) respondents. Primary data was collected through administration of well-structured questionnaires and data collected was analyzed using simple descriptive statistics, and likert scale. The results revealed that majority (57.1%) of the respondents were female of which 30% are married with a mean age of 42years. The findings also showed majority (100%) of the farmers were highly educated with mean years of 7 years of farming experience. The result further showed out of ten (10) variables of adaptation measures in controlling flood in the study area, eight (8) were shown to be often used. Result also showed that, out of the five (5) variables adjudged to be the major constraint to adoption strategies in the study area, all was shown serious major constraints. Female farmers dominate arable crop farming in flood-prone areas, highlighting the significant role of women in agriculture. Gender-specific challenges need to be addressed to improve adaptation strategies. The study therefore, recommended that improve access to credit and financial services to enable farmers to invest in necessary adaptation measures should be made available at all level by the government.

Introduction

Our environment is naturally blessed with dynamic resources to include vegetation, waters, soils and animals etc. Naturally, vegetation change, rivers are polluted, soil erodes and species are depleted all courtesy of human activities, while this is on the increase, some potentially more potent and dynamic activities on top of these already dynamic natural processes are surging up (Abah *et al.,* 2016). Man who is at the center has dramatically altered much of nature and its natural environment through a process which is not new because it has been on for very long. One significant dilemma in that transformation is that nature has been destroyed sharply over the last two centuries (Afrose, 2017).

Today, the natural environment is being progressively destroyed with bulldozers and forests (species) felled by machine or handheld saws and reduced to small remnants of its original extent. On the notion that efforts to stop further deterioration are never late, noted 'we still have half of all tropical forests that ever existed (Osikoya, 2017).

Environmental degradation is an increasing problem in many parts of the world inclusive of the study area, Abak Agricultural Zone. The phenomenon is most pronounced in the drylands, which cover more than 40% of the earth's surface (Dewan, 2017). Environmental degradation is mostly felt by people by people that stays in the wetlands areas. The wetlands areas are mostly susceptible to flooding and other degrading elements.

Environmental degradation is of varying types and degree and is generally un-evenly distributed in

Nigeria. Ranging from the less devastating such as sheet erosion and mild gullies, to highly dangerous types such as loss of biodiversity, drought and loss of soil bio-physical characteristics, a typical environment in Nigeria may be occupied with one or overlapping sets of degradation consequences (Okorie *et al.,* 2023*)*. Many of the areas in Abak Agriciltural Zone are erosion prone, it starts as shallow sandy soils but yet continue to remove surface cover to plant one or two seasonal crops thus exposing the land for the rest of the off-farm period of the year to splash and heavy downpours of the tropical continental climate which causes rill and gully erosion. Along the wetland areas in the study area issue of water pollution and other flooding activities occurs. Ecological degradation reduces the quality and fertility of the farmlands. Ecological degradation increases the cost of planting by the farmers, with a resultant loss in the fertility of the soils.

Specifically, this research outcome outline and answered the following questions; what are the social and economic variables of the farmers?, what is the estimate the coping effects of the social and economic variables in the adaptation of the mitigation strategies in controlling flood? And what are the constraints of adopting mitigation strategies in flood control?

Study Area

The study is carried out in Abak Agricultural Zone. The aim of the study is to evaluate the coping strategies of combating ecological challenges. Majority of the Ecological challenges that degrade the environment and affect Agricultural production will be evaluated in this study area.

Methodology

Population of Study

A total of 60 respondents will be randomly selected from 10 villages that have been affected by ecological challenges. 6 households are to be selected to give a total number of respondents.

Data Collection Technique

A data for this study will be collected from a well structured questionnaire that will take note of all the three objectives from the study. The questionnaire will have three sections which will cover the Socio-economic characteristics of the farmers, the social and the economic variables of the farmers and the mitigation strategy to convert the ecological challenges.

Analytical Technique

Descriptive statistics in the form of percentages, frequencies and standard deviation and mean will be used to elicit respondents enquires on the level of environmental degradation and the mitigation strategy adopted. A four point Likert scale will be used to elicit their responses.

Result and Discussion

Socio-economic Characteristics of Arable Crop Farmers

Gender: Table 3.1 shows that 42.9% of the respondents were male while 57.1% were female. This implies that female farmers dominate arable crop farming in flood-prone areas. The higher proportion of female farmers indicates a significant role of women in agriculture in the flood-prone areas of Abak. The finding is in line with Okorie, Umoh and Okon (2023) and Effiong (2019) that women are more involved in arable farming than the men counterparts. Farmers are spread across various age groups, with the largest percentage (24.3%) being over 50 years old. Age distribution shows a mean age of 42.1 years. The relatively high average age suggests that many farmers are middle-aged or older. This implies older farmers may have a wealth of experience but may be less inclined to adopt new technologies. Younger farmers, although fewer, can drive innovation if properly engaged. The finding corroborates with Okorie, Okoro and Eshiet (2022) that mean age of 45years.

Marital Status: The table shows that 12.9% were single, 30.0%were married,24.3%wereDivorced/Separated, and 32.8% wereWidow/Widower. A significant portion of farmers are widowed or divorced, indicating potential vulnerabilities. This finding corroborates with Effiong (2019); Bassey et al., (2015); Okorie et al., (2022); and Patrick et al., 2015 that most farmers in Akwa Ibom and Cross River State were married.

Educational Status: The result on educational attainment revealed that 15.00% of the respondents had primary education, 58.33% had secondary education, while 26.67% and 0% had tertiary and no formal education respectively. The mean years of educational attainment were 13 years. In all, a greater proportion had a formal Education which suggested that, farming activities in Abak Agricultural Zone are handled by enlightened persons. The study implies that higher education levels can facilitate the understanding and adoption of advanced farming techniques. This finding agrees with Udoaka *et al.,* (2019) and Julius *et al*., (2016) who posited that high percentage of farmers in the South-South region are literate.

Period of Farming Experience: Majority have 10-15 years of experience. Experience levels vary, with a significant number having substantial farming experience. The mean experience was 11 years and it is also in line with the work of Okorie et al., (2023), who posited that the mean farming experience of farmers in Abak Agricultural Zone of Akwa Ibom State stood at 10 years. Most cultivated Arable Crop: Cassava (30%) and yam (30%) are the most stable crops. Cassava and yam are the most stable foods produced, indicating their importance in the local diet and economy. This implies that subsistence farming is predominant, which may limit economic resilience.

Purpose of Cultivation: Household consumption was 60%, while commercial purpose was 40%. A majority of farmers grow crops primarily for household consumption, indicating subsistence farming practices. Commercialization efforts could help improve income and economic stability. The result also showed that majority (37.50%) of the respondents had family size that fell within 4-6 bracket. 26.67% fell within 1-3 bracket, 25.83% fell within 7-9 bracket and 10.00% fell within the bracket of 10 and above. The mean household size was 5 persons per farm family. This finding is in line with Bassey et al., (2015) and Okorie et al., (2023), who posited that the mean farm family size of farmers was 5 persons per household.

Farm Size: Hectares: 28.6%, squares: 30%. meters: 41.4%. The variation in farm sizes indicates diverse farming scales. Tailored interventions are necessary to address the specific needs of small, medium, and large-scale farmers.

Yearly Income: The study shows a mean income of ₦82,000. Income varies widely, with the highest percentage (20%) earning between ₦51,000-70,000. Low incomes reflect economic vulnerability. Financial support and income diversification are critical for enhancing resilience.

Table 3.1 Distribution of farmers by socioeconomic characteristics

Variable	Frequency	Percentage	Mean
Gender			
Male	30	42.9	
Female	40	57.1	
Total	**70**	**100**	
Age			
<20	8	11.43	
20-30	11	15.71	
31-40	25	35.71	42.1
31-50	13	18.57	
51-60	4	5.71	
<60	9	12.86	
Total	**70**	**100.0**	

Marital Status			
Single	9	12.9	
Married	21	30.0	
Divorced/seperated	17	24.3	
Widow/widower	23	32.8	
Total	**70**	**100.0**	
Educational qualification			
No formal education	0	0	
Primary education	11	15.71	
Secondary education	41	57.57	
Tertiary education	18	25.71	
Total	**70**	**100**	
Arable crop farmer			
Yes	28	40	
No	42	60	
Total	**70**	**100**	
Years in arable crop farming			
>20	10	14.3	
20-30	24	34.3	
31-40	12	17.1	
<40	24	34.3	
Total	**70**	**100**	
Most cultivated arable crop			
Cassava			
Rice	21	30.0	
Yam	11	15.7	
Maize	21	30.0	
Others	10	14.3	
Total	7	10.0	
	70	**100**	
Purpose of cultivation			
Household consumption	42	60	
Commercial purpose	28	40	
Total	**70**	**100**	
Family size			
<5	**26**	**37.14**	
5-10	**23**	**32.86**	
11-15	**14**	**20.00**	
>15	**7**	**10.00**	
Total	**70**	**100**	
Farm size			
Hectares	20	28.6	
Squares	21	30	
Meters	29	41.4	7
Total	**70**	**100**	
Yearly income			
<30000	14	820	
30000-50000	10	14.3	
51000-70000	8	11.4	
71000-90000	14	20.0	
91000-110000	13	18.6	
>110000	11	15.7	
Total	70	100.0	

Source: Field Survey, 2024

Adaptation measures in controlling flood

The result of the analysis on the Adaptation measures in controlling flood showed that, out of the ten (10) adaptation measures in controlling

flood in the study area, eight (8) were shown to be often used. These included; terracing ($\bar{X}$ = 2.50), drainage system ($\bar{X}$ = 2.27), making ridges ($\bar{X}$ = 2.24), early planting pattern ($\bar{X}$ = 2.17), crossbar ($\bar{X}$ = 2.16), contour farming ($\bar{X}$ = 2.09) land planning pattern ($\bar{X}$ = 2.09) and leaving crop residue/incorporating living plant year round ($\bar{X}$ = 2.06) Other include; planting of resistant crop ($\bar{X}$ = 1.99) and building of dams ($\bar{X}$ =1.96) were not often used by the respondents in the study area.

Table 3.2; Adaptation measures in controlling flood

Adaptation measures	Not often	Often	Very often	mean	Std. Dev
Making ridges	15	23	32	2.24	
Drainage system	4	43	23	2.27	.563
Terracing	3	29	38	2.50	.584
Contour farming	19	26	25	2.09	.794
Crossbar	14	31	25	2.16	.735
Leaving crop residue and /or incorporating living plant year round	21	24	25	2.06	.814
Planting of resistant crop	25	21	24	1.99	.843
Land planning pattern	18	28	24	2.09	.775
Building of dams	25	23	22	1.96	.824
Early planting pattern	15	28	27	2.17	.761

Source: field survey, 2024

Constraint to Adoption Strategies among Arable Crop Farmers in Flood Prone Area

Table 4.3 revealed the major constraint to adoption strategies among arable crop farmers in flood prone areas. The result showed that, out of the five (5) variables adjudged to be the major constraints to adoption strategies in the study area, all were shown serious major constraints. These included; lack of funds and inability to access loans ($\bar{X}$ = 2.80), poor access to sources of information ($\bar{X}$ = 3.08), land tenure problem ($\bar{X}$ = 2.92), lack of access to weather forecast technology ($\bar{X}$ = 2.70), and lack of drought resistance crop ($\bar{X}$ = 2.76).

Table 4.3: Major constraint to adoption strategies among arable crop farmers in flood prone area

Adaptation measures	Very serious	serious	Less serious	Not serious	Total	Mean
Lack of funds and inability to access loans	80	66	26	30	202	2.80
Poor access to sources of information	18	26	96	0	140	3.08
Land tenure problem	12	22	28	58	120	2.92
Lack of access to weather forecast technology	12	4	88	36	140	2.70
Lack of drought resistance crop	18	1	78	42	139	2.76

Source: Field Survey, 2024

Conclusions

The study on adaptation strategies among arable crop farmers in flood-prone areas of Abak Agricultural Zones reveals several critical insights and areas for intervention to enhance agricultural resilience and productivity. Female farmers

dominate arable crop farming in flood-prone areas, highlighting the significant role of women in agriculture. Gender-specific challenges need to be addressed to improve adaptation strategies.

Recommendations

i. Improve access to credit and financial services to enable farmers to invest in necessary adaptation measures. This can include providing subsidies, supporting microfinance initiatives, and facilitating easier loan acquisition processes.

ii. Enhance educational programs and training for farmers, focusing on modern farming techniques and effective adaptation strategies.

iii. Promote the engagement of younger farmers through targeted programs that encourage innovation and the adoption of new technologies.

iv. Address gender-specific challenges by improving women's access to land, credit, and resources. Implement programs that empower female farmers and address cultural constraints.

v. Leverage high membership in social organizations to disseminate information, share resources, and implement community-based adaptation strategies.

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