



## AWARENESS AND DETERMINANTS OF SUSTAINABLE AGRICULTURAL LAND MANAGEMENT PRACTICES AMONG CROP FARMERS IN EBONYI STATE, NIGERIA

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### ABSTRACT

This study analyzed the Awareness and determinants of Sustainable Agricultural Land Management Practices among Crop Farmers in Ebonyi State, Nigeria. Respondents' socio-economic characteristics and awareness of sustainable agricultural land management practices were investigated. A multi-stage sampling technique was employed in selecting 240 crop farmers used in the study. Data were analyzed using mean, frequency counts, percentage and binary logistic regression. The findings of the study revealed that, majority (71.7%) of the respondents were male, 70% were married, and 70% had one form of formal education or another. The mean age, household size, farm size and years of farming experience were 43 years, nine persons, four hectares and 21 years respectively. The study revealed that farm size, age, educational status, number of contacts with extension agents, household size and number of farm plots of the respondents were significant factors affecting their adoption of sustainable land management practices. Most of the respondents were aware of sustainable agricultural land management practices. There is therefore a need to implement more sustainable agricultural land management practices for food security and sustainability of the environment as most of the respondents were aware of these practices.

**Keywords:** Awareness, Land Management, Crop farmers and Sustainable Agriculture

### INTRODUCTION

Agricultural productivity is influenced to a considerable extent by the native soil fertility status and land management practices. The management issue can be taken for granted, given that land constitutes the productive base for the Nigerian agriculture, upon which the livelihoods of many rural and urban livelihoods depend (Omenihu, Opara-Ndidi and Kamalu, 2014). The most pressing challenge of Nigerian agriculture, in the new millennium, is how it can meet the food need of an ever-increasing population in the face of the myriads of social, cultural and economic problems that subjects the land to serious exploitation and depletion (Agboola, 2016). The role of agriculture in an agrarian economy like Nigeria cannot be overemphasized. Over 70 percent of the economically active population is employed in agriculture and agro allied industries. The sector provides over 90 percent of the food consumed locally and it is a major earner of foreign exchange after the petroleum sector (Seyi, 2019).

The importance of awareness creation as a component of agricultural extension in introducing new ideas, technologies and practices has since been recognized and given premium. Awareness is the first step in the adoption process when considering new ideas or technology (Jibowo, 1999). At the level of awareness, mass media tools such as radio, newspaper, magazine, television, motion pictures, slide shows, exhibits and printed materials are used to introduce new ideas and practices and alert people on emergencies such as the urgent need for the use of sustainable agricultural land management practices



by arable crop farmers in Ebonyi State of Nigeria. Although the awareness stage gives little information about the idea it portrays, it serves as an appetizer, catalyst or stimulant that arouse clients' interest to seek additional information on the idea in the subsequent stages of the adoption process. The success or failure of the other stages of the adoption process which include interest, evaluation, and, trial depends on how the awareness stage is managed. Awareness creation is therefore a critical issue that needs to be considered before selling any idea to its consumers.

The study area had witnessed land degradation in form of soil erosion, deforestation, ecological imbalance, climate change as the result of unsustainable management practices. Prager and Posthumus (2010), reported, it was only in 1980s, that awareness on the negative impacts of agricultural intensification on water and soil resources was incorporated into agricultural practice and soil conservation interventions. Prior to this period attention was geared toward the productivity paradigm with little or no attention on its harmful effects. It is essential to curtail the negative effects of harmful practices that reduce agricultural productivity, increase environmental hazard which endangers man and his future through effective awareness and appropriate management practices. An empirical understanding of the awareness and socio-economic determinants of the farmers in relation to adoption of sustainable land management practices becomes apt at this time. The study therefore seeks to:

- i. Examine the relationship between selected socio-economic characteristics of farmers and adoption of SLMs;
- ii. Investigate the awareness of sustainable agricultural land management practices among farmers.

## METHODOLOGY

The study was conducted in Ebonyi State. The major occupation of the people in the study area is agriculture. Crops produced in the area include, yam, cassava, maize and rice. Beside crops the inhabitants also keep livestock such as cattle, sheep and goats. A multistage sampling technique was used in selecting respondents for the study. Stage 1 was random selection of two (2) agricultural zones. In the second stage, two (2) local governments' areas were randomly selected from each agricultural zone giving four (4) LGAs. The selected local government areas were Ohaukwu, Izzi, Ikwo, Ezza South. In stage 3, four (4) farming communities were randomly selected from each of the LGAs making sixteen farming communities. Finally, fifteen (15) farmers were selected randomly from each of the sampled communities, making a total of 240 respondents for the study. Data were collected with the aid of well-structured questionnaire in which 230 copies were returned and used for the study. Descriptive statistics such as mean, frequency counts and percentage were used to analyze the data. To examine the causal relationship between the adoption of some sustainable land management practices and selected socio-economic variables, binary logistic regression model was adopted. The regression model in its linear form is presented as follows:  $Y = f(X_1, X_2, X_3, X_4, X_5)$  Where  $Y_i$  = use  $i^{\text{th}}$  land management practice (used=1, 0 otherwise)

$X_1$  = Total farm size (ha)



- X<sub>2</sub> = Age of farmer (years)
- X<sub>3</sub> = Education level
- X<sub>4</sub> = Number of visit by extension agents in the year
- X<sub>5</sub> = Number of farm plot
- X<sub>6</sub> = Household size
- X<sub>7</sub> = Error term

## RESULT AND DISCUSSION

Table 1 reveals the socio-economic characteristics of the respondents. Age of the respondents revealed that, majority (34.3%) of the respondents was within the age of 36 - 45 years and the mean age was 43 years. This shows that, majority of the respondents were within their productive age. This finding corroborates Ofuoku (2011) who reported that, most crop farmers were within their prime age. Respondents' sex reveals that, 71.7% of the respondents were male. This shows that, male were more involved in crop production in the study area than their female counterparts as the result of their access to land and other production inputs. This agrees with the findings of Edeogbon, Ajayi and Ubhoya (2008), that majority of the arable crop farmers in Ikpoba Okha local government area of Edo State, Nigeria were male. Marital status revealed, majority (70%) of the respondents were married, this may be attributed to the belief that getting married will help to reduce the cost of hired labour on the farm as family members will also help. Marriage is also regarded as mark of honour and dignity which is held in high esteem in the study area. 13% of the respondents were single while widows and widowers constituted 12.6% of the respondent. Educational attainment reveals that only 30% of the respondents had no formal educational while the remaining 70% had one form of formal education or another. This agrees with the findings of Babalola (2018), who reported that most of the arable crop farmers in Ogun State of Nigeria were literate. This high literacy rate was expected to influence farmers' awareness of sustainable agricultural land management practices. This finding is also an advantage for extension in which more respondents could read and interpret instructions and labels on chemical, fertilizers and seeds, among other information delivery activities that will enhance diffusion and adoption of agricultural innovations.

Household size shows that, majority (37.4%) of the respondents had household size within the range of 6 -10 persons while 10% of the respondents had household with more than fifteen persons with the mean household size of nine persons. This has implication for the fact that household size determines the availability of cheap family labour compared to hired labour. Based on the result, there may be great opportunity and need for hired labour since household size is small thereby creating demand for labour. Primary occupation reveals that, majority (64.4%) of the respondents had farming as their primary occupation as is common in most parts of rural Nigeria. Also 27.4% of the respondents were civil servants, while artisans, traders and students, collectively constituted 8.3% of the respondents. Secondary occupation reveals that, majority (35.7%) of the respondents were engaged in farming as their secondary occupation, 21.9% had no secondary occupation, 17.4% were engaged in trading as their secondary occupation, 10.4% were



artisans while 0.9% was students. This reveals that the entire respondents were engaged in farming. The fact that all the respondents were farmers brings to bare the need for awareness creation on use of sustainable agricultural land management practices (Andahi, 2016). Farm size indicates that, majority (72.2%) of the respondents had farm size of 1 - 4 hectares, between 5 -6 hectares were cultivated by 16.1% and only 1 1.7% had farm size more than 6 hectares with mean farm size of four hectares. This concur with findings of Oyewo, Oladeebo, Adesopo and Raufu (2019), who reported that, majority of farmers in Oyo State of Nigeria had farm sizes of 0.5- 5 hectares and less than 2 hectares respectively. This shows that majority of the crop farmers in the study area were operating at subsistence level. Fanning experience indicates that, most farmers (34.3%) had experience between 11-20 years. 25.3% had farming experience between 1 - 10 years, 24.3% had between 21-30 years of farming experience. 10% of the respondents had between 31-40 years of farming experience, 4.4% had 41 - 50 years of farming experience and only 1.8% had more than 50 years' experience. Majority of the farmers can easily adopt land regenerating management practices (Simon, Ndaghu and Yohanna 2013).

**Table 1: Socio-Economic Characteristics of the Respondents**

Variables	Frequency	Percentages
<b>Age(years)</b>		
≤ 25	16	7.0
26-35	48	20.9
36-45	79	34.3
46-55	49	21.3
>55	38	16.5
<b>Total</b>	<b>230</b>	<b>100</b>
<b>Mean age</b>	43	
<b>Sex</b>		
Male	165	71.7
Female	65	28.3
<b>Total</b>	<b>230</b>	<b>100</b>
<b>Marital status</b>		
Single	30	13.0
Married	161	70.0
Widows/widowers	29	12.6
Divorced	10	4.3
<b>Total</b>	<b>230</b>	<b>100</b>
<b>Educational attainment</b>		
No formal education	69	30.0
Primary education	32	13.9
SSCE	46	20.0
.NCE/Diploina	62	27.0



B.Sc./HND	21	9.1
<b>Total</b>	<b>230</b>	<b>100</b>
<b>Household size(persons)</b>		
1-5	76	33.1
6-10	86	37.4
11-15	45	19.5
15	23	10.0
<b>Total</b>	<b>230</b>	<b>100</b>
<b>Primary occupation</b>		
Farming	148	64.4
Civil servant	63	27.4
Trading	12	5.2
Artisan	22	9.6
Student	2	0.8
<b>Total</b>	<b>230</b>	<b>100</b>
<b>Secondary occupation</b>		
Farming	82	35.7
Civil service	15	6.5
Trading	40	17.4
Artisan	24	10.4
Students	2	0.9
No secondary occupation	69	21.1
<b>Total</b>	<b>230</b>	<b>100</b>
<b>Farm size</b>		
1-2	83	36.1
3-4	83	36.1
5-6	37	16.1
7-6	27	11.1
<b>Total</b>	<b>230</b>	<b>100.0</b>
<b>Farming experience</b>		
1-10	58	25.2
11-20	79	34.3
21-30	56	24.3
31-40	23	10.3
41-50	10	4.4
>50	4	1.8
<b>Total</b>	<b>230</b>	<b>100</b>

Source: Field survey, 2019

Socio-Economic Factors and Adoption of Sustainable Land Management Practices (SLMP)



Table 2 shows the result of the binary logistic regression to determine the socio-economic factors that affects the adoption of sustainable land management practices among the respondents. The results presented in table 2 show that 51.2%, 32.70%, 150.60% and 39.8% of variations in the use of crop rotation, cover cropping, bush fallow, mulching and use of fertilizer respectively were explained by the independent variables as implied by their pseudo R-square ( $R^2$ ) values. The variables that had significant effects on usage of the soil management practices are farm size, age, education, number of contact with extension agents, number of farm plots and household size of respondents.

Farm size positively influenced the use of mulching at 1% level of significance implying that respondents with large farm size had higher probability of making use of mulching. While farm size negatively influenced the use of crop rotation at 10% level of significance which implies that as farm size decreases the farmers may likely increase the use of crop rotation. The result is consistent with (Abdulazeez, Omotosho, Adekola and Adekunle 2014). The age of the household head was positive and significant at 10% probability level for the use of crop rotation, while the situation was different for the use of mulching which was negatively influenced by age of the household head at 5% probability level. This implies that an increase in the age of the household head will likely increase the use of crop rotation. Hence while the older and more experienced farmers will likely adopt crop rotation, the younger farmers will likely prefer to use mulching. This may be as a result of the fact that younger farmers are more innovative and better adopters than older farmers. Besides, preference for such practice may be due to the fact that it will reduce drudgery associated with highly labour intensive practices (Amusa, Enete and Okon 2014). The educational level of the farmers also positively influenced the use of fertilizer by the farmers. This was found to be significant at 5% level of significance. The more educated the farmers are, the higher their likelihood for the use fertilizer.

While the coefficient of number of contacts with extension agents was negative for crop rotation, cover cropping and bush fallow, it was positive for mulching and the use of fertilizer. This implies that the use of mulching practice and use of fertilizer will likely increase as the number of contacts with extension agents increases. On the other hand, as the farmers contact with extension workers reduce, the farmers' probability of using crop rotation, cover cropping, bush fallow will likely increase. This implies that the farmers will likely rely more on their indigenous knowledge and practices with reduced level of extension contact. The number of farm plots cultivated positively influenced the use of mulching. As such, farmers will likely use more of mulching as their farm plots increase in number. This may be due to increased labour requirements in higher number of farm plots which the farmers may not be able to afford. Crop rotation and cover cropping practices were however negatively influenced by the number of farm plots. This indicates that the use of crop rotation and cover cropping is likely to reduce with increase in number of farm plots (Aminu, Rosulu, Balogun and Babawale, 2018).





**Table 2: Effects of socio-economic factors on Adoption of Sustainable Land Management Practices**

Variables	Soil management practices				
	Crop Rotation	Cover Cropping	Bush Fallow	Mulching	Use of Fertilizer
Farm size ( $X_1$ )	-0.398***	0.251	-0.012	0.727*	0.069
Age ( $X_2$ )	0.05***	-0.024	-0.001	0.20**	-0.0065
Education ( $X_3$ )	0.103	0.001	0.001	0.089	0.150**
Contacts with Extension Agents ( $X_4$ )	-0.649*	-0.33*	-0.33	0.569*	0.321**
Number of Farm Plots ( $X_5$ )	-1.675*	-1.358**	-0.567	2.612*	-0.58
Household size ( $X_6$ )	-0.219***	-0.078	-0.021	0.134***	0.086
Constant	4.569	2.787	-0.356	-4.869	-1.546
$R^2$	0.512	0.327	0.156	0.554	0.398

Source: Data Analysis 2019

\*  $P \leq 0.01$ ; \*\*  $P \leq 0.05$ ; \*\*\*  $P \leq 0.1$

Table 3 reveals that all the respondents (100%) were aware of use of crop residue, 95.7% were aware of intercropping and bush fallow, 94.3% were aware of planting of legume crops as sustainable agricultural land management practices, conversely, 59.6%, 57.8% and 50% of the respondents were not aware of alley cropping, liming and green manuring as sustainable agricultural land management practices. The level of awareness was measured on two point rating scale of Aware A (1) and Not Aware NA (0) and the cut off mean was calculated to be 0.5 and was compared with the mean score for each practice. The analysis revealed that the mean scores for all the practices except liming (mean = 0.42) and alley cropping (mean = 0.40) fall below the cut off mean of 0.5. This implies that, there is high level of awareness of sustainable agricultural land management practices in the study area. This high level of awareness is an added advantage to agricultural extension, as awareness of a practice is the first step in learning how to use it, followed by interest stage which urges the clientele to seek more information about the practice. This leads to the evaluation. When the client is convinced of the value of the practice in his own situation, he tries it on a small scale. If the trial is successful, he adopts the practice or uses it until a better innovation is discovered. However, Ani (2007), added that the relative advantage of an innovation, its complexity, trialability, and observability also enhances the diffusion of an innovation from one place to another leading to its adoption or rejection.



Table 3: Awareness of sustainable agricultural of sustainable agricultural land management practices.

Practice	Aware (F)	%	Not aware (F) %		Mean scores
Crop rotation	193	83.9	37	16.1	0.84
Inter cropping	220	95.7	10	4.3	0.96
Organic Manuring	219	95.2	11	4.8	0.95
Mulching	180	78.3	50	21.7	0.78
Minimum tillage	191	83.0	39	17.0	0.83
Green manuring	115	50.0	115	50.0	0.50
Terracing	131	57.0	99	43.0	0.57
Contour bounding	169	73.5	61	26.5	0.74
Afforestation	200	87.0	30	13.0	0.87
Use of compost manure	153	66.5	77	33.5	0.67
Liming	97	42.2	133	57.8	0.42
Bush fallow	220	95.7	10	4.3	0.96
Planting of cover crops	214	93.0	16	7.0	0.93
Planting of legume crops	217	94.3	13	5.7	0.94
Use of crop resistant varieties	190	82.6	40	17.4	0.83
Alley cropping	93	40.4	137	59.6	0.40
Use of crop residues	230	100.0	0	0	1.0

Source: Field survey, 2019.

Cut - off mean = 0.5

## CONCLUSION AND RECOMMENDATION

Based on the study, the following conclusions were made: Majority of the crop farmers in the study area were male in their prime ages that had attained one level of education or another, married with small family sizes and had farming as their primary occupation. Farm Size, age, educational status, number of extension contact, household size and number of plots were significant factors affecting adoption of sustainable land management practices. There was high level of awareness of use of sustainable agricultural land management practices among the respondents. It is recommended that, agricultural extension in the study area should build on the existing level of awareness to implement more sustainable agricultural land management practices for food security and sustainability of the environment.





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