

Determinants of Sustainable Agricultural Land Management Practices Among Arable Crop Farmers in Northern Part of Taraba State, Nigeria

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ABSTRACT

This study analyzed the Determinants of Sustainable Agricultural Land Management Practices among Arable Crop Farmers in Northern Part of Taraba State, Nigeria. Respondents' socio-economic characteristics were determined and the determinants of sustainable agricultural land management practices in the study area were identified. A multi-stage sampling technique was employed in selecting 230 arable crop farmers used in the study. Data were analyzed by the use of mean, frequency count, percentage, logit regression and pearson product moment correlation. The findings of the study reveals that, majority (71.7%) of the respondents were male, 70.0 % were married, 70.0 % 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 Logit regression analysis revealed that, educational level ($\beta = 0.052$ $p < 0.05$), awareness ($\beta = 0.057$ $p < 0.05$), information source ($\beta = 0.011$ $p < 0.05$) and attitude ($\beta = 0.007$ $p < 0.05$) had the likelihood of increasing the use of sustainable agricultural land management practices in the study area. The Pearson Product Moment Correlation also revealed significant relationship between awareness, information source, attitude and constraints against the use of sustainable agricultural land management practices in the study area. Based on these findings, it was recommended that, arable crop farmers in the study area should be exposed to better sources of agricultural education, information and awareness on sustainable agricultural land management practices as these variables have the likelihood of increasing the use of sustainable agricultural land management practices in addition to addressing the constraints which negatively affect the respondents' use of sustainable agricultural land management practices.

Keywords: Agricultural Land, Arable Crops, Determinants, Farmers, and Management Practices.

1. INTRODUCTION

The challenge facing agriculture globally is how to provide food for the increasing world population which is projected to reach nine billion people by the year 2050 and at the same time conserve the environment [5]. Industrial farming promoted by green revolution led to increased agricultural productivity which saved more than one billion people from famine. Unfortunately, it left a legacy of degraded land, polluted soil, air and water. Sustainable intensification of agriculture which entails the use of agricultural practices that are economically and environmentally sustainable, offers a useful approach to tackling food in security facing the world as the result of increase in population and environmental degradation which have long term effect on agriculture globally. For innovations in sustainable agriculture to yield the desired results, there is need to understand the on farm and off farm determinants of use of sustainable agricultural practices for every region in view of the fact that, no single practice has universal application. In realization of this fact, this research,

- i. described the socio-economic characteristics of the respondents,
- ii. identified the determinant of use of sustainable agricultural land management practices in the study area,

- iii. analyzed relationship between awareness, information source attitude and constraints against the use of sustainable agricultural land management practices by the respondents.

2. METHODOLOGY

The study was carried out in northern part of Taraba state, Nigeria. Taraba state is located in the north east region of Nigeria. It is consist of 16 local government areas. The northern part of Taraba is comprised of six (6) local government areas. The area is made up of eight (8) agricultural extension zones and sixty (60) cell areas. Multi stage sampling technique was used to draw 230 arable crop farmers for the study. Stage one involved the inclusion of all the block areas in the study. In stage two, 25 % of cell areas in each block were randomly selected while stage three involved systematic selection of respondents based on household. Primary data for the study were generated by means of structured questionnaire. The data were analyzed using descriptive statistical tools of frequency, mean and percentage to present and describe the data while logit regression and pearson product moment correlation were the inferential statistics used to identify independent variables

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that have the likelihood of influencing the use of sustainable agricultural land management practices in the study area.

The logit regression equation was given by;

$$Y = a + b_1X_1 + b_2X_2 + \dots + b_{10}X_{10} \dots \dots \dots (1)$$

Where,

Y = Predicted arable crop farmers' use of sustainable agricultural land management practices.

a = Regression constant

b₁, b₂, b₁₀ = Regression coefficient attached to variable X₁, X₂, X₁₀.

X₃, X₇, X₈, and X₉ = Independent variables that significantly contributed to variance of the independent variables and;

X₁ = Age

X₂ = Sex

X₃ = Educational attainment

X₄ = Household size

X₅ = Farm size

X₆ = Farming experience

X₇ = Awareness

X₈ = Information source

X₉ = Attitude

X₁₀ = Constraint

The PPMC Formula is given by;

$$r = \frac{N\sum XY - (\sum X)(\sum Y)}{N\sum X^2 - \sqrt{(\sum X)^2 (N\sum Y)^2 - (\sum Y)^2}} \dots \dots \dots (2)$$

Where:

r = correlation coefficient

Y = dependent variable (use of sustainable agricultural land management practices)

X = independent variables of the study which include socio-economic characteristics of the respondents, awareness, attitude and constraints associated with the use of sustainable agricultural land management practices

N = total number of observations

∑ = summation

3. RESULTS 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 [4] who reported that, most arable crop farmers were within their prime age. This implies that, age is capable of influencing the use of sustainable agricultural land management practices. Respondents' sex reveals that, 71.7% of the respondents were male and 28.3% were female. This shows that, male were more involved in arable 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 *et al.* [2] that, majority of the arable crop farmers were male.

Marital status revealed that, 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. 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 Adesoji and Farinde [1] who reported that most of the arable crop farmers in Osun State of Nigeria were literate. This high literacy rate was expected to influence farmers' use of sustainable agricultural land management practices.

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. Since household size is small, there is great opportunity and need for hired labour to meet up with challenges of use of sustainable agricultural land management practices in the study area.

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 11.7 % had farm size more than 6 hectares with mean farm size of four hectares. This concur with findings of Ephraim [3], who reported that, majority of farmers in Karim Lamido local government area of Taraba State, Nigeria had farm sizes of 0.5- 5 hectares. This implies that, arable crop farmers in the study area were small scale farmers who may not implement higher sustainable agricultural land management practices as the result of their small farm holdings.

Experience influence farmer's decision to use, discontinue use or reject farm innovations. Farming experience indicates that, most (34.3 %) of the respondents had farming experience between 11 – 20 years, 25.3 % had farming experience between 1 – 10 years, 24.3 % had

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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 of farming experience

with the mean farming experience of 21 years. This shows that, most of the respondents were experienced farmers who may likely use sustainable agricultural land management practices to boast their productivity.

Table 1: Socio-economic characteristics of the respondents

Variables	Frequency	Percentages
Age(years)		
≤25	16	7.0
26-35	48	20.9
36-45	79	34.3
46-55	49	21.3
>55	38	16.5
Total	230	100
Mean age	43	
Sex		
Male	165	71.7
Female	65	28.3
Total	230	100
Marital status		
Single	30	13.0
Married	161	70.0
Widows/widowers	29	12.6
Divorced	10	4.3
Total	230	100
Educational attainment		
No formal education	69	30.0
Primary education	32	13.9
SSCE	46	20.0
NCE/Diploma	62	27.0
B.Sc./HND	21	9.1
Total	230	100
Household size(persons)		
1-5	76	33.1
6-10	86	37.4
11-15	45	19.5
>15	23	10.0
Total	230	100
Farm size		
1-2	83	36.1
3-4	83	36.1
5-6	37	16.1
7-6	27	11.1
Total	230	100.0
Farming experience		
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
Total	230	100

Source: Field survey, 2012

Results on Logit regression analysis in table 2, revealed the specific contribution of each independent variable to explain the variance in arable crop farmers' use of sustainable agricultural land management practices. The independent variables regressed were (i) age, (ii) Sex, (iii) Educational attainment, (iv) household size, (v) farm size, (vi) farming experience, (vii) awareness, (viii) information source, (ix) attitude and (x) constraints.

The variables gave chi-squared value of 85.444 and constant of - 0.825. The partial regression coefficients

(beta values) of the independent variables and dependent variables were removed. The table revealed that, educational level ($\beta = 0.052$ $p < 0.05$), awareness ($\beta = 0.057$ $p < 0.05$), information source ($\beta = 0.011$ $p < 0.05$) and attitude ($\beta = 0.007$ $P < 0.05$) were the independent variables that had the likelihood of increasing the use of sustainable agricultural land management practices in the study area. This implies that, a unit increase in the levels of these variables will lead to proportionate increase in the use of sustainable agricultural land management practices in the study area.

Table 3: Logit regression analysis of variables influencing the use of sustainable agricultural land management practices

Variables	Coefficient	Standard error	T value	P value	Decision
Constant	- 0.825	0.355	- 2.321	0.020	
Age	- 0.002	0.003	- 0.672	0.501	
Sex	- 0.041	0.067	- 0.608	0.544	
Educational level	0.052	0.025	2.064	0.039	**
Household size	0.004	0.006	0.705	0.480	
Farm size	0.003	0.007	0.442	0.659	
Farming experience	- 0.002	0.003	- 0.579	0.562	
Awareness	0.057	0.012	4.747	0.000	**
Information source	0.011	0.003	3.243	0.001	**
Attitude	0.007	0.003	2.036	0.041	**
Constraints	- 0.008	0.009	- 0.890	0.373	

Source: computer printout of Logit analysis for field survey, 2012.

** Significant at 0.05 level.

Table 3 reveals correlation between awareness, information sources, attitude and constraints associated with the use of sustainable agricultural land management practices. The findings reveals that, awareness ($r = 0.451$ and $P = 0.00$) information source ($r = 0.495$ and $P = 0.000$) attitude ($r = 0.226$ and $P = 0.001$) and constraints ($r = - 0.223$ and $P =$

0.001) were statistically significant at 0.05 level. However, the negative sign on the r value for constraints indicate negative correlation which means that farmers experiencing more constraints used less sustainable agricultural land management practices than farmers experiencing few constraints and vice versa.

Table 4.16: Correlation analysis of relationship between respondents' awareness, information source, attitudes, constraint and use of sustainable agricultural land management practices

Variable	r	P	Decision
Awareness	0.451	0.000	**
Information source	0.495	0.000	**
Attitude	0.226	0.001	**
Constraints	-0.223	0.001	**

Source: Field survey, 2012

** Significant at 0.05 level

4. CONCLUSION AND RECOMMENDATIONS

Based on the study, the following conclusions were made: Majority of the arable crop farmers were male in their prime ages that had attained one level of education or another, married with small family sizes and appreciable years of farming experience. Educational attainment, information sources attitude, and awareness were the major determinants of use of sustainable agricultural land management practices in the study area as they had the likelihood of influencing the use of sustainable agricultural

land management practices. Therefore, arable crop farmers in the study area should be exposed to better sources of agricultural education and information through awareness campaigns that will influence their attitude towards the use sustainable agricultural land management practices for food security, poverty alleviation and sustainable future. Also constraints associated with the use of sustainable agricultural land management practices should be minimized because of its negative effect on use of sustainable agricultural land management practices in the study area.

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