

DETERMINANTS OF ORGANIC FARMING ADOPTION AMONG RURAL FARMERS IN EPE LOCAL GOVERNMENT AREA, LAGOS STATE, NIGERIA.

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ABSTRACT

The growing concern about the negative effects of modern agricultural practices on human health, animals and the environment cannot be overlooked. To ensure the environmental sustainability, organic farming is one of the best practices to adopt. This study examined the determinants of organic farming adoption (OFA) among rural farmers in Epe Local Government Area of Lagos state Nigeria. Data used for this study was collected with the aid of well-structured questionnaire. One hundred and twenty (120) respondents were selected using multi-stage sampling procedures. Data were analysed using descriptive statistics and logistic regression models. The mean age of the respondents was 35 years, majority (86.5%) of the farmers were male, (50%) were married with mean household size of 3 persons. Furthermore (65.6 %) of the farmers had tertiary education and majority (77.8%) practiced crop production with mean farm size of 2 hectares and 8 years of farming experiences. majority (84.4%) of the farmers were aware of organic farming, while (57.8%) adopt. Source of information were through extension agent (47.8%), seminars (33.3%) and newspaper (25.6%). Factors responsible for OFA were, having adequate knowledge, better product quality than conventional ones and improvement of soil fertility at 54.4%, 53.3% and 52.2% respectively. Logistic regression revealed that age ($p < 0.01$), educational status ($p < 0.01$), household size ($p < 0.01$), cooperative membership ($p < 0.05$) and extension contact ($p < 0.05$) all had a positive significant relationship with OFA. There is need for provision of supportive services by the government with a view of subsidizing cost of organic farm inputs in order to motivate and encourage farmers towards the adoption of organic farming.

Keywords: determinants; adoption; organic farming; rural soil quality.

INTRODUCTION

Agriculture has been increasing in its production practices over the years with new technologies put in place to enhance productivity. Over the past four decades modern agricultural farming practices has been incorporated with the usage of excess amount of chemical inputs which have caused losses for the natural habitat balance and soil fertility. Examples of these losses are soil salinization, soil erosion, pollution due to fertilizers and pesticides, decreased groundwater level, genetic erosion. These hazards

have initiated ill effects on environment, degrade the food quality, increased the cost of production, and badly affect the farmer's life (Ullah, et. al., 2015). However, the negative effects of these modern agricultural practices on human health, animals and the environment at large cannot be overlooked. According to Njoroge, (2000) The negative environmental impacts associated with increasing industrialization of agricultural production and the belief that agricultural problems can be solved by the appropriate use of machines and chemicals has accelerated the development of alternative farming methods. To ensure environmental sustainability, organic farming is one of the best practices to adopt. Koan (2007) is of the opinion that organic farming is a cheap and a sustainable alternative in which farmers can produce without causing health or environmental damages. International Federation of Organic Agriculture Movement (IFOAM), 2013 defines "organic agriculture" as: "a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved." Basically Organic farming (OF) are very harmless to human health, retain the soils fertility and also sustain the ecosystems, because it depends upon natural biodiversity and locally adapted improved ecological processes or cycles, rather than genetically altered resources and the use of synthetic inputs (Ullah, et. al., 2015). Organic farming is becoming increasingly popular not only in India, all over the world. Many consumers are feeling disillusioned from chemically produced foods and are started to make the effort to buy organic food. The reasons are; their concern for the family members as well as the health of the environment. The good taste and nutritional value of organic food also attract the consumers. Inorganic agriculture uses a wide range of synthetic chemicals that inevitably leave residue in the produce: There are more than 130 different classes of pesticides containing some 800 entries (Plimmer, 2001). Pesticides residues enter the food chain via four main routes; on-farm pesticide use, post-harvest pesticides use, pesticide use on imported food and cancelled pesticides that persist in the environment (Kuchler et al., 1996). Given that the world's population is rising and with

the increasing severity of climate change, there is a need to increase food production in a sustainable way so as to halt the degradation of ecosystems, ecosystem functions and the loss of natural resources and biodiversity (IFOAM, 2013).

According to Ajilore, 2008 the depletion of soil nutrient due to continuous cropping reduces the soil organic matter, causes significant acidification and yield reduction. In other words, there is need to improve productivity without halting the production period and also reducing the negative impacts derived from intensive farming activities, some environmentally friendly production methods such as organic farming should be considered.

The adoption of agricultural innovation is very important in development of the farmer and the country as a whole, as agriculture is seen as a way out of poverty, so is the rate of adoption of agricultural innovation. Bandiera and Rasul (2006) stated that agricultural innovations are often adopted slowly and several aspects of adoption remain poorly understood. Several study reports on a number of constraints to adoption, such as extreme weather, awareness and knowledge (Diagne and Demont, 2007), risk aversion (Koundouri et al., 2006), institutional constraints, lack of financial capital, and lack of infrastructure (Foster and Rosenzweig (1995). These are considered as potential explanations for the determinant of adoption. This therefore gave the impetus to this study. Specifically this study sought to identify sources of information of organic farming, major determinant of organic farming adoption and the constraint of organic farming in the study area.

MATERIALS AND METHODS

The study was conducted in Epe Local Government area of Lagos State Nigeria. It lies on the North bank of the costal Lagos Lagoon and has road connections to Ijebu-Ode and Ikorodu. Epe has a total land area of 965 km² (373 sq m) and Coordinates at 6° 35N 3° 59E, at 2006 Census Epe population was 181,409. A traditional settlement of the Ijebu people (a subgroup of the Yoruba), it was established in the mid-18th century. Epe is a collecting point for the export of fish, cassava, mazi, green vegetables, coconuts, cocoa, palm produce, rubber and firewood to Lagos. Fishing and crop farming are their major occupation. Multi-stage sampling technique was adopted in this study. First stage involved the purposive selection of 3 (Three). LCDA in Epe local government area, second stage is the selection of five (5) communities, stage three is the random selection of six (6) rural farmers from each of the communities. This gave a total of 90 (ninety) respondents which constitute the sample size of the study. Data collected were analysed using descriptive statistics and Logit regression model. Specifically, logit regression was employed for the determination of the socio-economic factors influencing the adoption of organic farming. The following equation shows the logit regression model for this study:

$$Z = \ln \frac{p}{1-p} = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8$$

Where

Z = Probability of adoption

b₀= Coefficient of explanatory variable which increase or decrease

X₁= Age (in years)

X₂= Sex (male or female)

X₃= Educational level (years spent in school)

X₄= Marital status

X₅= Household size (No of people)

X₆= Farming experience

X₇= Farm size

X₈= cooperative membership

X₉ = farmers income(₦)

X₁₀= Extension contact

E = Error term

RESULTS AND DISCUSSION

The findings in table 1 reveals the socio-economic characteristics of the respondents. It reveals majority (86.5%) of the respondents were male while 13.3% were female. This implies that organic farming is dominated by male farmers in the study area. This may be due to the fact that organic farming is more tedious and male farmers are able to undertake the strenuous task associated with organic farming. Most(40.0%) of the respondents were 30 years and below, while few (8.9%) were between the ages of 50 years and above. The mean age of the respondent was 35 years. This implies that the respondents are still within their economically active age groups, perhaps will be proactive and ready to adopt new technology. Majority (65.6%) of the respondents had tertiary education, 26.7% had secondary, and 7.8 had primary education. Education appears to play an important role in adoption of any innovations, thus educated young farmers are more likely to adopt and try new technology. This is confirmed by Agwu&Anyanwu (1996) which noted that increase in educational status of farmers positively influence adoption of improved technologies and practices. Majority (68.8%) of the respondents were married. This is in line with Ekong (2000), who reported that majority of respondents involved in agricultural activities are married. The high rate of the distribution by married farmers could be to ensure food security to the household at easy daily reach. Also the mean household size was about 5 persons. Organic farming requires more manual labours than conventional farming; consequently, households with a larger number of family labours are more likely to adopt organic farming. Table 1 also shows that 52.2 of the respondents were Muslim while 38.9% of them were Christian and 8.9 practice traditional. This indicate that religion is not a barrier when it comes to OFA. Major occupation of the respondents was crop production with 77.8 percent with mean farm size of 2 hectares and mean

farming experience of 7years. Experience is a valuable asset in farming, it shapes farmer's opinion and guides his decision making prowess (Atoma,

2015).The mean monthly income of the respondents was ₦38,784K. However only few (26.7%) of the respondents belongs to a cooperative society.

Table 1: Socio-economic characteristics of the respondents

Characteristics	Frequency (n= 90)	Percentage	Mean
Sex			
Female	12	13.3	
Male	78	86.7	
Age			
≤30	36	40.0	
31-40	33	36.7	
41-50	13	14.4	
>50	8	8.9	34years
Educational background			
No formal education	11	12.2	
Primary	17	18.8	
Secondary	22	24.4	
Tertiary	40	44.4	
Marital status			
Single	25	27.8	
Married	62	68.9	
Widowed	2	2.2	
Divorced	1	1.1	
Religion			
Christianity	35	38.9	
Islamic	47	52.2	
Traditional	8	8.9	
Household size			
≤5	72	80.0	
6-10	16	17.8	
>10	2	2.25	
Major occupation			
Crop production	70	77.9	
Livestock production	10	11.1	
Both livestock and crop prod.	4	4.4	
Trading	4	4.4	
Self-employment	1	1.1	
Paid employment	1	1.1	
Farm size (hactares)			
≤1ha	27	30.0	
1.1-1.5ha	10	11.1	
1.6-2ha	27	30.0	
≥2ha	26	28.9	2
Farming experience(years)			
≤5	37	41.1	
6-10	30	33.3	
11-15	8	8.9	
>15	15	16.7	7
Cooperative membership			
Non member	66	73.4	
Member	24	26.7	
Monthly income (#)			
≤20000	23	25.6	
20000-50000	56	62.2	
≥50000	11	12.2	

Source: Field survey data,2018

Results from table 2 reveals that almost all (84.4%) of the respondent were aware and heard knowledge about organic farming, while 57.8% adopts the practice in the study area. The main source of information on organic farming in the study area

were through extension contact, radio and seminars with 46.7%,38.9% and 31.1 % respectively. Also majority (65.6%) of the farmers have one time or the other received OF trainings.

Table 2: Adoption and source of information on information on organic farming

Variables	Frequency Yes / No	Percentage
Have you heard about organic farming before?	76,14	84.4, 15.6
Did you adopt organic farming?	52, 38	57.8, 42.2
Any training received on OF	59,31	65.6, 34.4
Source of information on OF		
Extension contact	42	46.7
Cooperative	7	7.8
Family and friends	15	16.7
Radio	35	38.9
Television	18	20.0
Seminars	28	31.1
Religious gathering	22	24.4

Source: Field Survey Data, 2018

Pest and disease control method adopted by the respondents

Table 3 shows that 52.2 percent of the respondent uses cultural method (compost, green manure, crop residue and animal waste), 35.6 percent uses chemical control, 14.4percent uses biological control, 8.8 percent uses mechanical control while 16.7 percent use no method for pest control in the study area. According to Nyamangara et al (2003), reported

that, the management of soil organic matter with the use of composted organic waste is the key for sustainable agriculture. Also, Beltran et al.; (2002) ascertain that green manures when composted increased soil organic matter (SOM), provides nutrients for plant growth, alleviate aluminium toxicity, and render phosphorus more available to crops.

Table 3: Distribution of respondents by pest control

Pests and diseases control method	Frequency	Percentage
No control method	15	16.7
Mechanical	8	8.8
Cultural	47	52.2
Chemical	32	35.6
Biological	13	14.4

Source: Field Survey Data, 2018

Reasons for Adoption Organic Farming

Results from Table 4 reveals various reason why organic farming was adopted in the study area, prevention from family health problems had the highest percentage (55.6 %) followed by technical knowledge about OF with 54.4percent. Better quality of organic product than conventional product and OF

gives a positive image to the farm both takes 53.3% while improvement of soil fertility and structure,vested interest, personal satisfaction derived from organic product, high demand for organic produce, market availability had (52.2%, 48.9%.34.4%, 33.3%) respectively. The least was 25.6 percent which was farm income viability.

Table 4: Reasons for the adoption of organic farming in the study area

Reasons	Frequency	Percentage
It prevents family health problems from chemicals.	50	55.6
It brings personal satisfaction.	31	34.4
It improves soil fertility and structure.	47	52.2
Products have better quality than conventional ones.	48	53.3
Organic farming gives a positive image to the farm.	48	53.3
Increase in income	24	26.7
Organic farming helps to ensure farm's economic viability.	23	25.6
The management of organic farming is more flexible.	31	34.4
Availability of market	27	30.0
Access to organic input	24	26.7
Vested interest	44	48.9
Knowledge about organic farming	49	54.4
High demand for organic product	30	33.3

Source: Field Survey Data, 2018

Determinants of organic farming adoption in the study area

Logit regression analysis was used to analyse the determinant of organic farming adoption among respondents in the study area. The results as shown in table 5, the log likelihood value of the model is 63.973. The chi- is 57.502, The R^2 value of 0.739. This implies that about 74% in the variations of organic farming adoption was jointly explained by the independent variables in the model. The result revealed that age of the respondents ($p < 0.01$), educational level ($p < 0.01$), household size ($p < 0.01$), cooperative membership ($p < 0.05$) and extension contact ($p < 0.05$) were the major determinant of organic farming adoption in the study area. The positive significant relationship between the age of the respondents and OFA implies that younger farmers are innovative, adventurous and have greater intentions to explore new technology than older farmer. However, age is a strong determinant of OFA. This findings is in line with findings of Welsch, (1965); William et. al., (1971); and Ezeano (2010) who concluded that young farmers are more receptive than older ones as the older ones are not always ready to part with the old techniques for new ones. Level of education was also found to be positively significant. The higher educational attainment among the respondents enhances individual reasoning, perception and attitudes about an innovation. This indicates that educated farmers are more likely to practice organic farming in the study area. This agrees with the findings of Agwu & Anyanwu (1996) which noted that increase in educational status of farmers positively influence the adoption of improved technologies and practices. Furthermore, on table 5 it shows that household size was also significantly correlated with organic farming adoption. This could be because organic farming requires more manual labours than conventional farming; consequently, households with a larger number of family labours are more likely to adopt

organic farming. This corroborates with the findings of (Feder, 1985) reported that large number of family members, that are able to join on-farm activities enhances farmers' adoption of a labour intensive technology. This is why Pandel and Lampkin (1994), stated that the labour input measured in terms of either hours of work or full-time job is usually greater on organic than on equivalent conventional farms. Other studies show that the main reason why organic farming require more labour is to carry out manual and mechanical tasks essential to growing. The preparation for sale on the farm or on the market also involves more labour on organic holdings (Patrick and Alain, 1999). Extension contact was also significant, this is an indicator that extension agent has intensified their effort in the mobilization integration and diffusion of relevant knowledge to local farmers so that new sustainable practice or innovation are adopted.

Cooperative membership also ($p < 0.05$) had a positive significant relationship with organic farming adoption in the study area. This could be as a results of various meeting held in the associations on ways to improve and increase farmers' productivity. This supported with the findings of Yahaya and Omokhaye (2001), that the social involvement of farmers through their participation in farmers' co-operatives will enhance diffusion of information among the farmers.

The result further revealed that, farming experience ($p < 0.01$) and farm size ($p < 0.05$) significant level had negative significant relationship with organic farming adoption. This implies that the probability of adopting organic farming reduces with farming experience and farm size. Farmers farm size and farming experience, does not determine the adoption of organic farming in the study area. This correlates with the study of Njeru, (2016) who established that there is no statistically significant relationship between size of the farm and the period of practicing organic farming. As such, a farmers' land size does not influence OFA. This however, negates the

findings of Kafle, (2011) who reported that farmer’s participation in organic farming- related training and visits, farm size has significant influence on OFA. The findings also agree with the literature that organic producers are newer entrants to farming

(Padel, 2001). This can be attributed to the fact that farmers who have been long in farming business are usually older and more resistant to change than new entrants.

Table 5: Determinants of Organic Farming Adoption in the Study Area

Variables	β coefficient	Wald	Sig.
Constant	-4.781	3.136***	0.008
Age	0.027	2.150***	
Sex	1.051	0.919	0.338
Educational level	1.030	2.666***	0.002
Marital status	0.968	1.541	0.214
Household size	0.036	2.126***	0.002
Farming experience	-0.343	-10.471***	0.001
Farm size	-0.336	-2.126**	0.042
Cooperative membership	2.048	2.295**	0.005
Income	0.028	3.959	0.090
Extension contact	0.034	1.965*	0.001
Constant			
Model Summary			
-2 Log likelihood	63.973		
Cox & Snell R Square	0.476		
Nagelkerke R Square	0.739		
Chi-Square	57.502		

Source: Computed from Field Survey Data, 2018.

*significant at 10%, **significant at 5%, *** significant at 1%

Constraints of organic farming in the study area

Table 6 shows the constraint of organic farming in the study area, high cost of inputs(\bar{x} =2.50), climate change (\bar{x} =2.44), inadequate information on OF(\bar{x} =2.39), insufficient credit capacity (\bar{x} =2.07),were found to be the major constrains of organic farming in the study area among all other factors . this study supports the findings of Ezeano, (2010) who investigated factors related to the

adoption of improved farm practices and the isolated variables include farmer age, education, years of experience, social and tenural status, agro-climate, location, farm size, credit, and characteristics of the innovation itself such as relative advantage, compatibility, complexity, divisibility and communicability, techniques of communication, amount of participation and the use of traditional culture.

Table 6: Constraints of organic farming in the study area

Constraint	Mean	Std. Deviation
Inadequate information on OF	2.39	1.269
Climate change	2.44	1.333
Lack of farmland	1.27	1.207
Lack of stable market	1.26	1.259
High cost of inputs	2.50	1.392
Poor transportation	1.09	1.098
Inadequate extension T&V	1.07	1.068
Insufficient credit capacity	2.07	1.285
Off-farm activities	1.32	1.244
Government policy	1.20	1.238
Valid N (listwise)		

Source: Field Survey Data, 2018

CONCLUSION

The study showed that most of the farmers in the study areas adopt organic farming practices, with their source of information being extension agent and media (Radio and television). The study further

indicated that age, level of education, household size, household size and cooperative membership are positive and significantly associated with the adoption of organic farming in the study area.

RECOMMENDATION

Based on the findings from the study, the study therefore recommends:

- i. There is need for provision of supportive services by the government with a view of reducing/ subsidizing cost of organic farm inputs in order to motivate and encourage farmers towards the adoption of organic farming.
- ii. Promoting and strengthening of cooperatives should be encouraged by stakeholders, to solve the low prices received by producers, cooperatives should encourage organic farming, because cooperatives are service rendering organizations that do not strive for profit and they are also mean of disseminating information.
- iii. There is need for training of rural farmers about organic farming, thus, strategies should be made by extension service to aware the farmers of the benefits of organic farming as it will help the increase rate of organic farming and also change their behaviour and perception about new technology.

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