

Socio-economic assessment of organic farming practices for soil management among vegetable farmers in peri-urban areas of Oyo State, Nigeria

✉ **Agboola A. F. and I.A. Adekunle**

*Department of Agricultural Extension and Rural Development,
Obafemi Awolowo University, Ile-Ife, Nigeria*

✉ *Corresponding author faagboola@yahoo.com*

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Abstract

Study was carried out to assess organic farming practices of vegetable farmers in Oyo State with a view to identifying those that are environmental friendly. The study specifically identified the various organic farming practices in the study area that are soil protective and also examined the benefits derivable from such practices and challenges associated with their use. Multistage sampling procedure was used to select 240 vegetable growers in 16 selected peri-urban areas of the State. The result revealed that the mean age of the farmer is 46.7 years with annual income of ₦380,680.00 on vegetable production. The organic farming practices identified were zero tillage, use of compost, animal manure, mulching, hand weeding, use of natural pesticides, use of commercial organic fertilizers, fallowing and crop rotation. It was also revealed that the benefit derivable from organic farming practices included soil protection, user friendliness and safety, high profit, local availability of resources, and extensive use of indigenous knowledge, while the major constraints include labour intensive, time consuming, bulkiness, irritating odour and inadequate training. Result of inferential analysis also revealed that there exist positive significant correlation between variables like availability of resources ($r=0.173$), openness ($r=0.197$), and user friendliness ($r=0.204$) and soil management ability of organic farming practices identified. In conclusion, organic farming practices, if well applied, will help a lot in the country's quest for agricultural soil and water conservation.

Key Words: Organic farming practices, Peri-urban, Vegetable production.

Introduction

Organic agriculture is a holistic agricultural system that combines best traditional, innovation and scientific knowledge to promote an ecosystem's health while minimising adverse effect on natural resources. It is a sustainable and environmental friendly production system that offers developing countries a wide range of economic, environmental, social and cultural benefit. (Adekunle, 2012). According to Nigerian Organic Agricultural Network (NOAN, 2010) report, it was observed that Organic agricultural practice is developing rapidly and is now being practiced in more than 160 countries of the world. As at the end of 2009, almost 38 million hectares of land were managed organically all over the world by 1.5 millions farmers of which majority (44%) are in Africa. This indicates Africans' readiness to improve their standard of living through this sustainable agricultural development.

Research from Olusegun Obasanjo Centre for Organic Research and Development (OOCORD) (2006) further showed that organic agriculture is a good option for food security in Africa, comparable to most conventional system and to be more sustainable in the long run. It builds traditional agriculture and utilizes both traditional and scientific knowledge. Organic agriculture is a form of sustainable or ecological agriculture that involves production according to precise standard with the principles of Care, Ecology, Health and Fairness (Adeoluwa, 2010).

Organic vegetable production is as old as peasant farming, though its cultivation is still at household level with very few farmers producing in a commercial level. Most rural farmers placed emphasis on these vegetable crops production because they believe that they enhanced body metabolism. The nutritional values of the edible portion of the vegetables have been reported to be rich in protein, carbohydrates, fibres, vitamins, minerals and as antioxidants. It is also a recipe for children and adults suffering from anaemia most especially organically grown vegetables in low per capital income country like Nigeria (Eifediyi, 2008). Organic agriculture is the most common recipe that gives health and wealth because organic foods assist in the management of non-communicable diseases such as diabetes, cancer and hypertension, while at the same time the environment is sustained (Adeoye, 2011).

The organic vegetable farmers used locally available organic materials which were renewable and available locally in their areas, such practices include composting, crop rotation, mulching, use of plant parts as a source of organic agents in pest control management and soil fertility. This system has sustained the vegetable farmers in providing basic food needs and it is also a common practice that optimizes the meager resources for increased output. The use of farmer-friendly organic farming practices with potential for pest and disease controls that are environmental friendly is highly desirable (Akanbi *et al.*, 2006)

Organic farming practice involves using improved scientific techniques to achieve good crops and livestock yields without harming the natural environment or the people who live and work in it. Since development is about people, whatever resources placed at man's disposal by nature becomes beneficial and sustainable based on his ability to wield control over them for appropriate utilization. This occurs through keeping and building good soil structure and fertility, controlling of pests, diseases and weeds organically, careful use of water resources and good animal husbandry. These differentiate organic farming from conventional farming where the use of artificial chemical fertilizer, herbicides, pesticides and other chemicals which create a lot of havoc to our environment, increasing the cost of production, decreasing nutritional quality and reducing resistance of animals to diseases.

The problem of procurement and cost of these inorganic fertilizers, chemicals for weeds, pests and diseases control and likes apart, the hazardous effect of continuous application of these synthetic chemicals on the soil is a thing of concern. The environmental costs incurred through modern and chemical intensive farming system are so high and of immense concerned to the environmentalists and the world at large. Rampant pesticides use, soil depletion and genetic homogenization of crop threaten the air we breathe, the water we drink and the land we and others depend on for food and habitat (Adekunle, 1995). Thus sustainable organic agriculture is the only realistic and necessary alternative to those practices.

The main objective of this study is to assess organic farming practices of vegetable farmers in Oyo State and the specific objectives are to:

- i. describe the socio-economic characteristics of vegetable farmers using organic practices in the study area;
- ii. identify organic farm practices engaged in by the respondents;
- iii. describe the specific characteristics of organic farm practices; and
- iv. identify benefits and constraints associated with organic farm practices in the study area.

The hypotheses tested are:

1. There is no significant relationship between peri-urban farmers' socio-economic characteristics and their level of participation towards the organic farming practices for soil management.
2. There is no significant association between social economic characteristics of Peri-urban farmers and their level of participation towards organic farming practices for soil management.

Methodology

The study was carried out in sixteen peri-urban areas of Oyo State. These peri-urban areas are located within Oyo, Ogbomoso and Ibadan zones consisting of 4, 5 and 7 locations respectively. 15 vegetable growers were selected from each location, which adds up to total of 240 respondents for the study.

Data were elicited from the survey of vegetable farmers using validated, pretested and structured interview scheduled in the selected locations for this study. The information collected in the survey was on vegetable farmers' socio-economic characteristics and factors associated with the organic farm practices in vegetable production. Qualitative data was also collected using Focus Group Discussions (FGDs). Descriptive statistical techniques such as frequency, percentages, mean and weighted mean scores were used to summarize the data collected while Chi-square, correlation and regression analysis were used to draw inferences from the hypotheses.

Results and Discussion

Table 1 shows that (70%) of the respondents were between 31-50 years. The mean age of vegetable farmers in selected areas was 46.7 years with standard deviation of ± 8.8 . Most of these young people were actively involved in vegetable farming using organic farm practices especially during the dry seasons. This age range of 31-50 years could make them be in better position to have easy access to training and skill acquisition in organic farm practices in cultivation, processing activities and even marketing of the products in their neighbouring urban towns and cities.

Also shown on Table 1 is that majority (75%) of the vegetable farmers were male. The result indicated that there were more males involved in organic farm practices on vegetable production than females in the study area. However, it was further revealed that 80% of the females were involved in hawking or marketing of these vegetable products. Since most of the

organic farm practices and management requires time and energy which females may not be able to effectively cope with because of other responsibilities which are mostly domestic.

Table 1 indicates further that majority of respondents (85%) spent between 1-6 years in school, Majority were literate. Attendance of formal schools provide opportunity for enlightenment and exposure in various area of life which encourages understanding and adoption of an innovation among peri-urban farmers. The ability to read and write could be of help in improving their agricultural productivity.

On land acquisition, Table 1 reveals further that majority (80%) of the respondents rented their farmland. The low percentage of the respondents who inherited their farmlands had the advantage of gaining access to land easily where they could practice organic farm practices at any season without any hindrances, compared to those who rented their farmland for the same purposes. The implication shows that there was limitation to the type of activities that farmers could be involved in as tenants.

Majority (70%) of the respondents had a farm size of less than 2.6 acres (1ha) (Table 1). The mean farm size of the respondents was 2 acres with standard deviation of ± 0.2 . This finding is not far from expectation since vegetable production does not require large farm size as earlier reported by Adekunle (2012).

Furthermore, Table 1 reveals that majority (60%) of the respondents had been in farming business between 1-10 years, while the rest (40%) had above 10 years farming experience. The mean year of farming experience was 10 years, with standard deviation of ± 0.5 . It implies that majority of the respondents had been long in some of these organic farming practices, and this influences their accessibility to organic raw materials and more acquisition of knowledge in organic farm practices from parents and friends.

Income level realized by majority (80%) of respondents from their vegetable farm were more than ₦300,000.00 per annum on vegetables alone with mean annual income of ₦380,680.00 (Table 1). The level of income realized from the vegetable production. by the farmers can influence their level of interest on some of organic farm practices in their respective vegetable farms. According to Farinde (1995), farmers with high level of income can have high capacity of acquiring more farm inputs such as land, commercial organic fertilizers and others inputs that would be of assistance in boosting their production capacity and raising their standard of living.

Results in Table 2 reveal that the various organic farm practices identified in the study areas with corresponding percentages of respondents involved were as follows: hand weeding (90%); hoeing (85%); composting/manure application (85%); selective seasonal planting (80%); use of ashes (70%); slashing using cutlasses (65%); ridge making (65%); traditional irrigation system/wetting (65%); use of commercial organic fertilizers (60%) fallowing (60%); Mulching (55%); use of natural pesticides (55%); crop rotation (50%). All these farming practices aforementioned had been in use traditionally by the respondents only with

some modifications such as manure application, land clearing /tillage methods, crop rotation and hand weeding for pest control. Farmers find it more convenient to use these practices since they were more culturally compatible with the existing indigenous practices as well as likewise availability of those practices. It is hereby deduced that organic farm practices that were highly used based on the percentage ranking were due to the degree of intensification of farming system, availability of farm inputs, easy accessibility to indigenous knowledge for the practices and economic reasons.

Table 1: Distribution of respondents according to socio-economic characteristics.

Variables	Frequency	Percentage	Mean
Age			
≤30	72	70	
>30	30	168	46.7
Sex			
Male	180	75	
Female	60	25	
Religion			
Islam	144	60	
Christianity	96	40	
Ethnicity			
Yoruba	192	80	
Others	48	20	
Years of schooling			
1-6	204	85	
Above 6	36	15	
Land acquisition			
Farmland owner	192	80	
Tenant			
Farm size (acre)			
Below 2.	168	70	
Above 2.6	72	30	2
Farming experience (Years)			
≤10	144	60	
Above 10	96	30	10
Income (annually)			
≤ ₦ 300,000.00	48	20	
> ₦ 300,000.00	192	80	380,680.00
External orientation*			
Never travelled	228	95	
Outside their LGAs			

Source: Field survey 2012

From the results presented in Table 3, it was shown that among the characteristics of the organic farm practices, user's friendliness in terms of preserving the environment and people that live in it was rated most (95%) by the respondents. Organic farm practices encourage

harmonious co- existence between environment and organisms that live on it through various organic farming activities. As a result of these characteristics, organic farm practices for vegetable production stands a better chance in terms of usage.

Table 2: Distribution of respondents by organic farm practices identified.

*Organic Practices	Farming Complete Frequency	usage of Organic farm practices Percentage (%)
Hand weeding	216	90
Hoeing	204	85
Composting/manure application	204	85
Selective seasonal planting	192	80
Use of ashes	168	70
Slashing using cutlasses	156	65
Traditional wetting/irrigation	156	65
Ridge making	156	65
Use of commercial organic fertilizers	144	60
Fallowing	144	60
Use of natural pesticides	132	55
Crop rotation	120	50

*Multiple responses

Source: Field survey, 2012

Table 3: Distribution of respondents by characteristics of the organic farm practices.

*Variables	Frequency	Percentages
Users' friendliness	228	95
Compatibility	216	90
Openness	204	85
Cost profitability	192	80
Ecological friendliness	192	80

*Multiple responses

Source; Field survey, 2012

Results presented in Table 3 further show that compatibility of organic farming innovation to the existing traditional system of farming was rated high (90%). This indicated that these organic farming innovations were compatible with the old system of farming practices with some little modifications. This shows that many of the respondents were interested in accepting the new development in organic farming since the practices of organic vegetable production were in line with the existing farming system. They would not perceive it as completely new technology or ideas. The modifications were accepted without fear.

Table 3 shows further that most (85%) of the respondents agreed that organic farm practices were more or less opened to the respondents in terms of training and discussion about the management practices without restricting age or sex. This would motivate people to accept it more since there was no secrecy with regards to its mode of operating or practices irrespective of location or ethnicity as stated by Agboola (2006).

Majority of the respondents (80%) agreed that indigenous farming was more profitable and less costly to practice than conventional farming (Table 3). It could be inferred from the study that most of the farmers in peri-urban areas were motivated into organic farm practices because of the cheapness and profitability. Also majority (80%) of the respondents perceived that organic farm practices were at better advantage compared to conventional farming for vegetable production in peri-urban areas.

Majority (80%) of the respondents indicated that organic farm practices were not hazardous to the environment and other living organisms living in it including human beings (Table 3). The system also reduces pollution in peri-urban areas and allows the inhabitants to live in harmonious environment compared to conventional agricultural practices, and also stand at better advantage in terms of longer period of soil fertility and preservative of natural ecosystem as stated by Kolawole (2001).

Results presented in Table 4 show that among the reasons or benefits for usage of organic farm practices by the respondents, economic benefit in terms of profitability had the highest percentage (90%), followed by ecological friendliness (80%), and preference for quality foods, taste and health improvement (65%), while resources availability for organic farm practices was the least (60%) among the benefits rated by the respondents for their usage of organic farm practices. Majority of the farmers in peri-urban areas attached significant importance to most of these vegetables particularly the vegetables that were grown using organic farm practices or naturally grown which is devoid of agro chemicals and were of high quality in terms of taste and medicinal potency.

Results in Table 4 show further that in terms of constraints associated with the use of organic farm practices, inadequate inputs and training/knowledge were rated highest (70%) among the constraints, high number of respondents (60%) perceived that the practices were time consuming. More than half of the respondents (55%) considered nauseating and irritating odours of some organic inputs especially compost as constraint while (50%) of the respondents supported that organic farming practices are labour intensive. The result in Table 4 shows that if adequate inputs and training were provided for the respondents, the rate of usage would rise appreciably among the people in peri-urban, since other remaining constraints such as time consuming and bulkiness could still be tolerated in the course of continuous practicing of these organic farm practices for vegetables.

Table 5 reveals that there is significant relationship between socio-economic characteristics of vegetable farmers in peri-urban such as age ($r = -0.04$; $p \leq 0.05$), farm size ($r = 0.18$; $P \leq 0.01$), income level ($r = 0.15$; $p \leq 0.05$), external orientation ($r = 0.04$; $p \leq 0.01$), and the participation level of peri-urban farmers towards organic farm practices in vegetable production. It shows

that both farm size, income and eternal orientation, were positively correlated with the level of participation of peri-urban farmers in usage of organic farm practices for soil management.

Table 4: Distribution of respondents by benefits and constraints from organic farm practices.

*Variables	Frequency	Percentage
Benefits		
Economic	216	90
benefits(profitability)	192	80
Ecological friendliness	156	65
Preference for quality food (health)	144	60
Availability of resources	144	60
Easy to practice		
Constraints		
Inadequate input/training	168	70
Time consuming	144	60
Irritating odour/nauseating	132	55
Stressful/labour intensive	120	50
Bulkiness	120	50

*Multiple responses.

Source; Field survey, 2012

Results of regression analysis are presented in Table 6. Regression was used in order to show the magnitude of the change in the level of participation of peri-urban farmers in organic farm practices. The result of regression coefficient (b) shows that; household size (b=0.14; p<0.01), year of formal schooling (b=0.30; p≤0.01), farm size (b=0.41; p≤0.01) and sources of information (b=0.40; p≤0.01) were all significant with the level of participation of peri-urban farmers in the use of organic farm practices in vegetable production in the study area. r²=0.429 indicated that almost 43% of these independent variables contributed or accounted for change in the dependent variable in the study.

Table 7 shows that there exists a significant association between selected socio-economic characteristics such as sex ($\chi^2=121.34$; p≤0.01), religion ($\chi^2=99.37$; p≤0.01), marital status ($\chi^2=277.51$; p≤0.01) and the level of participation of peri-urban farmers in the usage of organic farm practices in vegetable production. The contingency coefficient revealed strong association with religion (c= 0.53; p≤0.01), sex(c=0.57; p≤0.01), and participation level of peri-urban farmers towards organic farm practices in vegetable production. This indicates that sex, religion and marital status had higher association with level of participation level of peri-urban farmers in most of organic farm practices in vegetable production in the study area.

Table 5: Result of correlation analysis of the relationship between peri-urban farmers' participation in organic farm practices in vegetable production and socio-economic characteristics of respondents.

Variables	r	r ²	P-value
Age	- 0.04*	0.002	0.050
Farm size	0.18**	0.031	0.005
Income on vegetables	0.15*	0.023	0.017
Number membership of associations	0.27*	0.071	0.026
Sources of organic farming knowledge	0.15*	0.023	0.018
Cosmopolitaness	0.21**	0.043	0.001

* Significant at p≤0.05; ** Significant at p ≤0.01

Source: Field survey, 2012

Table 6: Multiple regression showing the relationship between respondents' socio-economic characteristics and level of participation of peri-urban farmers on organic farm practices.

Variables	Regression coefficient (b)	t-value	P-value
Age	0.11	1.517	0.092
Household size	0.14**	2.656	0.008
Years of schooling	0.30**	5.286	0.000
Farm size	0.41**	4.615	0.000
Farming experience	0.11	1.519	0.130
Sources of information	0.40**	7.538	0.000
Income	0.07	0.766	0.444
No of membership association	0.13**	4.215	0.012

r²=0.429, r=0.655, F=22.628, p≤0.01

*Significant at ≤0.05; **Significant at≤0.01

Source: Field survey, 2012

Table 7: Chi-square (χ^2) analysis showing association between peri-urban farmers' participation in organic farm practices and selected socio-economic variables of respondents.

Socio-economic variables	χ^2	C	P-value
Sex	121.34**	0.57	0.000
Marital status	277.51**	0.73	0.000
Religion	99.37**	0.53	0.006
Sources of labour	288.22	0.69	0.963

*Significant at≤0.05; **Significant at≤0.01

Source; Field survey, 2012

Conclusion and Recommendations

Most of the respondents were still in their productive age. They are young and mainly depend on their family as the main source of labour to carry out pre and post planting operations using various organic farm practices to produce various kinds of vegetables for nutritional value, medicinal purposes and improving soil fertility as well as sustaining their environment. Most of the skills were acquired through their parents.

There were significant relationships between level of participation of peri-urban farmers in organic farm practices in vegetable production and the variables such as; educational level, household size, farm size, farming experience, income, openness, resources availability and knowledge transferability. It can therefore be concluded that organic farming system is a sustainable tool in retaining good environment, maintaining food quality and improving on food security in our country.

Based on the results discussed above the following recommendations are made:

- (1) There is need to strengthen farmers by promoting organic farm practices and encourage the exchange of knowledge among resource poor farmers producing vegetable products. This can accelerate and help to develop local skills, providing foundation for improving access to food through local markets and enhancing food security for non-farming community and urban people as well.
- (2) Researchers in the related fields should continue to explore the role of indigenous knowledge in production of organic foods which promote human health and safety and make use of new holistic research methods that will encompass cultural practices in organic food production.
- (3) There is need to protect farmers' right to conserve biodiversity and to enhance local ecosystem which protects local and organic food products.

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