Perceptions and Attitude of Vegetable Farmers towards Organic Agricultural Practices in Ishielu Local Government Area of Ebonyi State, Nigeria

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ARTICLE INFO	ABSTRACT
	This study assessed Farmers' Perception and Attitudes towards Organic Agricultural Practices in Ishielu Local Government Area of Ebonyi State. The study employed purposive and multistage random sampling procedures in the selection of one hundred and twenty (120) respondents. Primary data were collected through field survey with the aid of a well-structured questionnaire and interview schedule. Both descriptive and inferential statistics were employed in data analysis; which was done according to the specific objectives of the study. Results showed that the major vegetable crops grown in the study area were pumpkin (100%), eggplant (75%) and plantain (50%) among others. Further analysis revealed fellow farmers (82%), radio (74%) and Farmers' Associations (67%) as major sources of information on organic vegetable farming to the rural farmers. The result further revealed that the respondents have good knowledge about organic farming as shown by their positive perceptions about it. Multiple regression analysis was used to establish the relationship between the socio-economic characteristics of the farmers and the number of sources of information on organic farming. A high R^2 of (76%) was obtained. Most of the independent variables were statistically significant and met a priori expectations. The result of factor analysis identified: financial, institutional and environmental factors as constraints to organic vegetable farming in the area. It was concluded that farmers in the study area had favorable perception towards organic farming with moderate knowledge of its benefits. Recommendations such as encouraging youths to get involved in organic vegetable farming, better enlightenments and sensitization of the entire area on the beneficial effects of organic farming were made, among others.

Introduction

Organic farming is a form of agriculture which excludes the use of synthetic fertilizers, pesticides and plant growth regulators. Organic farming is gaining popularity in Africa today as it can diversify agricultural production system toward attaining improved productivity, farm income, and food safety. It is seen as a sustainable alternative to chemical based agricultural systems (Stockdale, Lampkin, Hovi, Keatinge, Lennartsson, Macdonald, Padel, Tattersall, Wolfe and Watson, 2001; Biao, Wan, Ding and Yang, 2003). IFOAM (2000) has defined organic agriculture as "a process that develops a viable and sustainable agro-ecosystem. Organic production systems are based on specific and precise standards of production, which aim at achieving agro-ecosystems, which are economically, socially and ecologically sustainable. According to Regnold (2001); Organic farming aims at improving soil fertility by providing an ideal soil system for plant growth. It improves the physical, chemical and biological properties of the soil and thus, builds up the soil health. Organic agriculture is developing rapidly and at least some developed countries produce organic food commercially (Reddy, 2010). As a result, there is enormous potential in practicing organic farming in vegetable growing lands, because organic agriculture is productive and sustainable (Regnold, Palmer, Lockhart and Macgregor, 1993; Letourneau and Goldstein, 2001; Mader, Filefback, Dubois, Gunst, Fried and Niggili, 2002). Organic cultivation is attracting farmers all over the world due to its various advantages over modern agricultural practices. Essentially, it is a farming system which supports and strengthens biological processes without resorting to inorganic remedies such as chemicals or genetically modified organisms (Reddy, 2010). Organic fertilizers can improve the soil by lowering bulk density, and they can reduce soil erosion and improve soil fertility (Gant, 1981). Organic matter encourages formation of crumb soil structure thus improving soil drainage, infiltration and aeration. The major goal of organic farming is sustainable production of quality food with little or no effect on the environment. This goal has not been fully achieved by current agricultural practice, i.e. inorganic farming, hence the need to encourage organic farming which is capable of providing solutions to the current agricultural problems and help to achieve optimal production of quality food sustainability (IFOAM, 2007).

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Vegetables provide essential nutrients to humans affordably with its vantage cheap and reliable sources of protein, vitamins and minerals for body development and repair. They render relished support to main cereals in the country. Fruits, nuts and vegetables in the daily diet have been strongly associated with reduced risk for some forms of cancer, heart diseases, stroke and other chronic diseases (Hyson, 2002). Vegetable farmers in Ishielu Local Government Area of Ebonyi State, Nigeria have been producing various varieties of vegetable due to high cost of organically produced products and high demand of the products in the area. The farmers achieved these by the use of poultry manure, compost, green manure and crop residue to improve their soil fertility. Organic farming produces safe and nutritious food as it helps prevent soil pollution by stopping risky chemical reactions in the soil and avoiding produce contamination, as well as soil erosion by wind and rain.

Attitudes are frequently described in terms of personal consistency, as a "latent concept" that is individual-dependent (Vogel, 1994). According to Hyytia and Kola (2005), "Ajzen defines attitudes as latent and hypothetical characteristics that can only be inferred from external, observable cues. Also, Banyte, Joksaite and Virvilaite (2007) note that attitude is how for or against, positively or negatively, favorably or unfavorably a person regards a particular object. This definition aims to reveal to a particular object. Hadriman (2004) in his study has found that the nutritional value was an important factor that influences consumers' preferences in purchasing chemical free vegetable, followed by desire, freshness, health effect and taste. Increasing soil organic matter has added benefit of improving soil quality and thereby enhancing the long-term sustainability (Laird, 2001). The above findings, led to the call for organic farming which mainly relies on the principle of organic matter generations. Organic farming systems differ from conventional systems in several aspects such as no artificial pesticides or fertilizers are used on organic farms, organic farms generally have a wider crop rotation scheme, and also have larger areas of non-crop habitats (Seyed, Hosain, Khalil, Yaser and Abbas, 2010).

Many conventional farmers consider converting to organic farming due to the rapidly growing market for organic products and the prospect of higher prices. However, they are also unaware that organic farming may entail some constraints possibly higher costs, and are therefore, unsure whether they will be economically better off at the end if they convert. The development of organic farming is very complex and it involves many different actors, including farmers, advisor, processors, traders, retailers, researchers and policy makers. Therefore, one of the main important parties that can enable a country to produce more organic products through organic farming system is usually the result of their attitude, knowledge of the practices as well as their perception.

Organic farming is gaining popularity all over the world, as it can diversify agricultural production systems towards attaining productivity, farm income and food, as well as environmental safety. In 1960s and 1970s, environmentalists focused on the biophysical and human health effects of chemical fertilizers and pesticides, leading to the popularization of alternative food systems that take into account consumer safety and paving way for the development of organic farming. Despite the global awareness of environmental degradation and climatic change that could result from continuous practice of inorganic farming and the threats it poses on agricultural production, many vegetable farmers in Ishielu Local Government Area of Ebonyi State, Nigeria are still producing vegetable inorganically. There seem therefore to exist gap in knowledge on the enormous benefits of organic agriculture and several inherent health and environmental adversities associated with chemical agriculture, hence the need to investigate the perceptions and attitudes of vegetable farmers towards organic Agricultural practices in Ishielu L.G.A of Ebonyi State, Nigeria.

Furthermore, ranching with livestock and farming with chemicals have desertified, deforested, poisoned and stripped vegetation from the land. Ecologically, there are impacts of industrial-style farming on groundwater through pesticide and fertilizer run off (The African Organic Farming Foundation, 2004). Chemical fertilizers are known to have damaging effects on the terrestrial and aquatic environments (Jiyane and Svotwa, 2006). In drinking water, high concentrations of nitrate can cause methemoglobinemia, a potentially fatal disease in infants also known as blue baby syndrome. Chemical fertilizers leach into underground water resources and surface water bodies (Palaniappan, 1995), bringing conditions like water hardiness and eutrophication. This endangers living organisms in the water. The use of pesticides and chemical fertilizer in farming can also lead to produce contamination and the destruction of some beneficial insects which help in pollination.

In order to contain this trend, organic farming becomes the only option. In organic farming, Integrated Pest Management (IPM) is a Pest Control Strategy that uses an array of complementary methods like natural predators and parasites, Pre-resistant varieties, cultural practices, biological controls and various physical techniques to control Pest. Consumers consider buying organic products as a way to "vote their dollar and mitigate the environmental impacts of conventional agriculture" (Alkon, 2008; Shreck, Getz and Feenstra, 2006). Many consumers assume that all organics are produced sustainability (Rigby and Caceres, 2001). According to Kuepper (1998), the application of organic material in agriculture has contributed immensely to converting the poor fragile land of the world into stable productive zones.

Objectives of the Study

The broad objective of the study is to investigate the perception and attitude of vegetable farmers towards organic agricultural practices in Ishielu Local Government Ares of Ebnyi State.

The specific objectives are to:

i. identify the major vegetable crops grown in the study area;
ii. ascertain sources of information on organic agriculture;
iii. analyze farmers' knowledge level and perception about organic agriculture;
iv. determine the relationship between the socio-economic characteristics of the vegetable farmers and their sources of information on organic farming; and
v. identify constraints to organic vegetable farming in the study area.

Hypothesis

H_{01}: There is no significant relationship between the socio-economic characteristics of the vegetable farmers and their sources of information on organic farming in the study area.

Methodology

This study was undertaken in Ishielu L.G.A of Ebonyi State, Nigeria. Multi-stage purposive and random sampling techniques were employed in the selection of the respondents. Six (6) communities were purposively selected from twelve

(12) autonomous communities due to their ability to produce vegetable in large quantity. Four (4) villages were randomly selected from each of the six communities to make a total of twenty four (24) villages. Five (5) vegetable farmers were randomly selected from the 24 villages to make a total of 120 respondents who were used for the study. Primary data were sourced through questionnaire and oral interview schedule and analyzed using descriptive and inferential statistics. Objectives I, II and III were analyzed using descriptive statistics such as frequency counts and mean scores derived from a 4-point Likert type scale. Objectives IV and V were analyzed using multiple regression and factor analyses. The null hypothesis was tested with F-test at 5% level of significance.

Model Specification

The multiple regression model is specified below:

$Y = f (X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8)$ implicit form

$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + e_t$

   Y = Sources of information (Number of sources) Dependent Variable

   Bo = Constant term

   X_1 = Age (Years)

   X_2 = Sex (Dummy, Male = 1, Female = 0)

   X_3 = Marital status (Single = 1, Married = 2, Widowed = 3 and Separated = 4)

   X_4 = Farming Experience (Years)

   X_5 = Educational Level Attained (Years)

   X_6 = Annual Income (Naira)

   X_7 = Farm size (Hectres)

   X_8 = Household size (Number)

   b_1-b_8 = Parameter estimates

   e_t = error term

   X_1-X_8 = Independent variables

Test of Hypothesis

The null hypothesis was tested with F-test as shown:

$$F\text{-cal} = \frac{R^2 (N-K)}{(1-R^2)(K-1)}$$

Where:

R^2 = Coefficient of multiple determination

N = Sample size

K = Number of variables

   Decision Rule: If F-cal > F-tab, reject the null hypothesis, otherwise accept its alternative.

Results and Discussion

Major Vegetable Crops Grown in the Study Area

Major vegetables crops are referred to as vegetables commonly grown in large quantity for commercial purpose by the farmers in the study area. The result obtained is shown in Table 1.

Table 1. Percentage Distribution of the Respondents based on Types of Vegetables Grown

Types of Vegetables	Frequency * (N = 120)	Percentage (%)
Asparagus	20	17
Cucumber	50	42
Pumpkin	120	100
Tomato	15	13
Lettuce	5	4
Eggplant	90	75
Avocado	7	6
Carrot	17	14
Onion	3	3
Plantain	60	50

   Source: Field Survey, 2015.

   *Multiple Responses Recorded

Table 1 shows that majority of the respondents (100%) grew pumpkin in the study area, followed by eggplant (75%),

plantain (50%) and cucumber (42%). This conforms to the work of Taiwo, Akande and Adediran (2006) who made similar observations.

Sources of Information on Organic Agriculture

Sources of Information on organic farming are channels through which farmers gain access to useful information on organic farming activities and other aspect of livelihood such as marketing. There are various sources of information on organic agriculture to rural farmers in the study area. These were itemized in order to identify the greatest sources of information available to the respondents. The result obtained is shown in Table 2.

Table 2. Percentage Distribution of Respondents based on their sources of information on organic vegetable farming.

Information Sources	Response	Percentage (%)
Radio	89	74
Television	50	42
Extension agents	65	54
Fellow farmers	98	82
Friends	75	63
Relatives	48	4
Farmers association	80	67
Newspaper	10	8
Internet	2	2
Age grade	40	33

   Source: Field Survey, 2015.

   *Multiple responses recorded

The result in Table 2 revealed that respondents had access to information on organic farming through a variety of sources. The responses of the respondents indicated that majority of the farmers' sourced information through fellow farmers (82%), followed by radio (74%), farmers association (67%), friends (63%), extension agents (54%) and television (42%). Only few of the respondents sourced information through relatives, age grade, newspaper and internet accounting for 4% 33%, 8% and 2% respectively. This implies that while informal sources characterized farmers' major information platform on organic vegetable farming, radio broadcast plays significant role in organic vegetable production information dissemination in the area. This is in agreement with the work of Morrow (2002) and Oyesola and Oladeji (2008) who confirmed that most farmers in rural area now use ICTs such as radio, phones, and television in accessing vital information for their agricultural activities. This partly supports the assertion of FAO (1989) that radio was among the electronic media used successfully in rural areas.

Farmers' Perception about Organic Agriculture

This is the view of farmers about organic farming, and it was considered using mean scores obtained from a 4-point likert scale. The result obtained is shown in Table 3.

The result of mean score analysis on farmers' perception about organic agriculture as presented in Table 3 shows that the farmers perceive organic farming as labour intensive (X= 3.5), produces health friendly produce than conventional farming (X = 3.2), is more profitable than conventional farming (X = 2.9), gives priority to long term ecological health (X = 2.8) and focuses on sufficient biological processes (X = 2.7). These were accepted because they scored above the decision point (2.5). This supports the findings of Dipeolu *et al.* (2006) that farmers, in general, had a positive perception of organic produce. Also Tratnik and Zutnic (2009) observed that the attitude of vegetable growers towards organic agriculture was positive.

The implication of this findings is that organic farming adoption has great potentials in the study area if farmers are encouraged and motivated through adequate training and efficient information network.

Table 3. Mean Score for Farmers' Perception about Organic Agriculture.

Farmers' Perceptions	Mean	Decision
Organic farming is labour intensive	3.5	Accept
Organic farming is more profitable than conventional agriculture	2.9	Accept
Organic agriculture does not support mechanization	1.8	Reject
Available organic inputs cannot support commercial agriculture	2.4	Reject
Organic farming produces health friendly produce than conventional farming	3.2	Accept
Organic farming focuses on sufficient biological processes	2.7	Accept
Organic agriculture gives priority to long term ecological health	2.8	Accept

Source: Field Survey, 2015.

Table 4. Percentage Distribution of the Respondents according to their Knowledge about Organic Agriculture

Farmers' Knowledge	Frequency * (N=120)	Percentage (%)
Organic farming will decrease the production cost by reducing the input purchases	60	50.00
Organic farming can increase the income of farmers	59	49.17
Organic farming is very difficult to implement	30	26.00
Organic farming is effective in increasing the texture and fertility of soil	52	43.33
Bio-pesticides are more suitable to control pests than chemical pesticides.	41	34.17
Bio-herbicides are more suitable to control weed	25	20.83
To	*267	

Source: Field Survey, 2015.

*Multiple Responses.

The result in Table 4 showed that sufficient proportion (50%) of the respondents had good knowledge of the benefits of organic farming in decreasing the cost of production, increasing the income of farmers (49.17%) and effective in increasing the texture and fertility of soil (43.33%). However, only 34.17% accepted that bio-pesticides are more suitable to control pest than chemical pesticides and 20.83% agreed that use of bio-herbicides can control weed infestation than chemical herbicides in the farm. Very few (26.00%) believed that organic farming is difficult to implement. This implies that the knowledge of the respondents about the benefits of organic farming was between moderate to low.

Relationship between the Socio-economic Characteristics of the Respondents and their Sources of Information on organic vegetable farming in the Study Area.

The relationship between the socio-economic characteristics of the respondents and their sources of information on organic agriculture was determined using Ordinary Least Square multiple regression analysis. The result obtained is summarized in Table 5.

Multiple regression carried out to determine the relationship between the socio-economic characteristics of the respondents and their sources of information on organic vegetables farming showed a coefficient of multiple determination (R^2) of 76%.

Table 5. Linear Multiple Regression Analysis on the Effects of Socio-Economic Characteristics of Farmers on their Sources of Information.

Variable	Coefficient	Standard	T-value	Significance
Constant	0.277	0.343	0.638	*
Age(X_1)	-0.007	0.007	-1.050	NS
Sex (X_2)	0.012	0.009	1.308	**
Marital Status (X_3)	0.006	0.006	1.152	NS
Farming Experience (X_4)	0.472	0.041	11.484	*
	1.000E-006	0.000	0.753	*
Educational level (X_5)	0.015	0.007	2.069	**
Income (X_6)	-0.008	0.097	0.086	***
Farm Size (X_7)	0.502	0.071	7.095	*
Household Size (X_8)				

Source: Field Survey, 2015.

*Significant at 1% level.

**Significant at 5% level.

***Significant at 10% level.

NS = Not Significant.

$R^2 = 0.765$ (76%)

Adjusted $R^2 = 0.765$ (75%)

F-ratio = 69.731

Standard Error of the Estimates = 0.38171

DW = 2.273.

This shows that about 76% of the change in the dependent variable (No. of sources of information) on organic vegetables farming was caused by the socio-economic characteristics of the farmers. It is believed that the exploratory power of the chosen model was not exaggerated since the R^2 (0.765) and adjusted R^2 (0.754) were closely related in numerical values. This was further confirmed by the value of the overall standard error of the estimates (0.3817) which constituted the percentage of the variation that was not explained.

The statistical reliability of the regression model was established using standard deviations from the estimates or standard error of the co-efficient of independent variables which were less than half of the estimates. However, the overall significance of the regression was confirmed by F-statistics which showed significance at 1% level of significance.

Result showed that Age (X_1) was negatively signed and statistically insignificant. This showed that increase in the age of the farmers led to a corresponding decrease to their sources of information on organic vegetable farming. This implies that old farmers could not access information as much as young farmers. This is true and confirmed to a priori expectations because old farmers may be weak and generally unable to acquire relevant information from different sources, since they may not possess requisite strength to actively source information on novel trends in agriculture. The adoption of any innovation on organic farming may not be as high as expected, ass adoption can vary inversely with age (Ogunyani, 2005).

Sex (X_2) had a positive coefficient and was statistically significant at 5% level of significance. This shows that there was gender bias in access to basic information on organic agriculture. Both men and women farmers in the study area do not have equal access to information on organic farming. Likewise, marital status (X_3) was positively and

insignificantly related to the dependent variable. This indicates that there is difference between married and single persons on organic vegetable farming information access in the study area.

However, the respondents farming experience (X_4) was positively and significantly related to the number of sources of information on organic vegetable farming. This shows that the higher the farming experience of the farmers, the more they had access to information on organic farming. Moreover, educational status (X_5) bore positive coefficient and was statistically significant at 1% level of significance. This implies that educated farmers had more access to information than uneducated farmers. This is true and confirmed a priori expectation that educated farmers are more intelligent than uneducated ones and may possess necessary sources of information like radio and television in their household.

Income (X_6) was positively signed and statistically significant at 5% level of significance. This entails that increase in the income of the farmers led to an increase in their source of information. This is true because farmers who earn higher income can afford necessary information and communication technology facilities that will enhance their access to information on organic farming.

Farm size (X_7) was negatively signed and statistically significant at 10% level of significance. This shows that farmers who had larger farm size had less access to information on organic vegetable farming and this is contrary to a priori expectation. The household size (X_8) of the respondents was positively signed and statistically significant at 1% level of significance. This is true because different members of the household would acquire information from different sources and share them among themselves.

The final regression equation is shown below:

$Y = 0.277 - 0.007x_1 + 0.012\ x_2 + 0.006x_3 + 0.472x_4 + 1.00x_5 + 0.015\ x_6 -$
$(0.007)^{NS} \quad (0.009)^{**} (0.006)^{NS} \quad (0.041)^{*} \quad (0.000)^{*} (0.007)^{**}$

$0.008x_7 + 0.502x_8 + et$
$(0.097)^{***} \quad (0.071)^{*}$

Constraints to Organic Vegetable Farming

Factor analysis was applied to determine constraints to organic farming in the study area.

The result obtained was presented in Table 6.

From data obtained from field survey, three (3) major constraints were extracted based on the responses to suggested variables. Only variables with constraint loading of 0.30 and above 10% overlapping variance (Ashley, Amber and Anthony, 2006; Madukwe, 2004) were used in naming the factors. Variables that are loaded in more than one constraint or those lower than 0.3 were not considered. The next thing to do as reported by Kessler (2006) was giving each constraint a denomination that best describes the set of variables contained in it. In this regards, the variables were grouped into three (3) major constraints, I (Financial Constraint), constraint II (Institutional Constraint) and Constraint III (Environmental Constraint).

Constraint I was considered and named financial constraint due to the variables that loaded high under it. These were: high inputs costs and lack of financial support. After critical examination, factor II was considered and named institutional constraint due to the variables that loaded high under it. These were: lack of awareness, insufficient extension contact, lack of appropriate agricultural policy, non-availability of farm inputs, output marketing problems and inadequate supporting infrastructure.

Table 6. Varimax Rotated Component Matrix on Constraints to Organic Vegetable Farming in the Study Area.

Variable Names	Factor 1 Financial	Factor 2 Institutional	Factor 3 Environmental
Lack of awareness	-0.388	0.419	0.118
High inputs cost	0.710	0.211	0.152
Lack of financial support	0.730	0.045	0.069
Lack of appropriate agricultural policy	0.051	0.834	0.029
Non-availability of farm inputs	-0.160	0.590	0.168
Low production	0.055	0.135	0.768
Output marketing problems	-0.031	0.488	-0.540
Inadequate supporting infrastructure	0.066	0.995	-0.017
Inability to meet the export demand	0.228	0.293	-0.524
Lack of quality standards for bio-manners	-0.039	-0.025	0.141
Insufficient extension contacts	-0.128	0.561	0.096
Cultural stigma	0.159	-0.406	-0.052

Source: Field Survey, 2015.

Finally, factor III was considered and named environmental factor due to the variable which loaded high under it; low production. Low production may be associated with environmental issues which influence production negatively. The findings of this study support the report of Mustapha, Bzugu and Sanusi (2012) who identified constraint in the form of insufficient funds for extension service as a major barrier to organic farming in Nigeria. Age *et al.* (2010) also reported that the progress in organic farming has been slow in Nigeria. Similar studies have been documented in other countries of the world (Mohammed *et al.*, 2007; Kerselaers *et al.*, 2007; and wheeler, 2008) which were attributed to many barriers such as those identified by this study.

Test of Hypothesis

F-test was used to test the H_o: there is no significant relationship between the socio-economic characteristics of the vegetables farmers and their sources of information on organic farming in the area. This was subjected to the relation:

$$F\text{-cal} = \frac{R_2\ (N\text{-}K)}{(1\text{-}R_2)(K\text{-}1)}.$$

From the regression result,

F-cal = 69.731

For F-tab

$V_1 = K\text{-}1 = 8 - 1 = 7$

$V_2 = N - K = 120 - 8 = 112$

Hence,

F-tab at 5% level of significance = 2.09

Therefore since F-cal (69.731) > F – tab (2.09), reject the null hypothesis. This implies that there is significant relationship between the socio-economic characteristics of the vegetable farmers and their source of information on organic farming in the study area.

Conclusion and Recommendations

Based on the findings of this study, it can be concluded that the farmers were mostly women, married and moderately educated. The major vegetables grown in the study area are pumpkin, eggplant and plantain. The farmers had access to information on organic farming through various sources of which fellow farmer, radio and farmers association recorded the highest. A good proportion of the farmers had good knowledge of organic farming and favorable perception towards organic vegetable farming. However, widespread application of organic farming to vegetable production was limited by financial, institutional and environmental factors in the area. Based on the findings of this study, it was recommended that men and youths should be encouraged to be actively involved in organic farming; Integrated Pest Management (IPM) should be incorporated in the extension programme of the state; sensitization programmes on organic farming should use preferred sources of information such as GSM, radio and farmers associations disseminated in local language; Finally, the research and extension support activities should be concerned with the identification of suitable varieties of crops and technologies that are adapted to organic farming in the farmers' environment.

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