

Original Research Article

Willingness to Pay for Organic Vegetable in Ado-Ekiti Metropolis, Ekiti State, Nigeria.

Abstract

This study was conducted to assess willingness to pay for organic vegetables in Ekiti State, Nigeria. Multi-stage sampling technique was used to collect data from 60 respondents that were purposively selected from 3 organizations within the State i.e. Ekiti State University, Ado-Ekiti, Federal Polytechnic, Ado-Ekiti and Ekiti State Government Secretariat, Ado-Ekiti. Descriptive statistics was used to analyze the socioeconomic characteristics of the respondents, the level of awareness of the consumers and preference of respondents regarding organic vegetables. Tobit regression model was used to analyze the relationship between socio-economic characteristics and willingness to pay for organic vegetables in the study area. Result of data analysis showed that 95% of the respondents had prior knowledge of organic vegetables. Also, 93.3% of the respondents agreed that organic vegetable was healthier than the conventional ones. The result also showed that out of the six organic vegetables the respondents were willing to pay for, cucumber recorded the highest premium (₦49.33). The result from the tobit regression showed that household size, educational level and monthly income were statistically significant at 5%, 1% and 1% respectively, implying that they were the variables influencing willingness to pay for organic vegetables in the study area. Independent variables with positive signs i.e. household size and awareness implied that the higher these variables, the higher the willingness to pay for organic vegetables. It is therefore recommended that organic agriculture should be promoted to meet export and domestic needs as this will lessen poverty and ensure food security in Nigeria. Also, the three tiers of government, including the private sector, should mount serious awareness campaigns to sensitize Nigerian populace on numerous benefits of organic farming especially on health, finance and environment.

Keywords: Willingness, organic vegetable, Tobit regression

1.0 Introduction

Food security remains an issue of growing concern in sub-Saharan Africa (SSA), and in the drive to overcome this challenge, the tendency of government in the region has been to formulate policies and design programmes to draw farmers into high-input technology (United Nations Conference on Trade and Development) (UNCTAD) and (United Nations Environment Program) (UNEP) (UNEP-UNCTAD, 2008). As a result of this, the use of agrochemicals is now becoming an obvious part of current agriculture production systems in SSA (Sosan *et al.*, 2008). In Nigeria, for instance, an estimated 125,000 to 130,000 Mt of pesticides are applied annually for agricultural pest control, the highest in West Africa (UNSD, 2012). The country's import bill on synthetic fertilizer totaled about USD 2 billion between 2006 and 2010 (UNSD, 2012). A wide array of agrochemicals exist, all of which are potentially harmful and have been linked to adverse human health conditions and environmental problems (WHO, 1990; FAO, 2004). In developed countries, stringent laws and regulations on agrochemical use exists, and adherence is strictly enforced (e.g., European Union's Food Regulation EC/178 (EC, 2009); United States Environmental Protection Agency (EPA, 1997)). On other hand, in most SSA countries these

laws are either non-existent or ineffective and, environmental pollution and other associated problems seem to continue unabated (Sosan *et al.*, 2008). This is particularly true in the context of Nigeria, where the extent of pollution of the agrarian communities (which constitute over 60 percent of the population) by agrochemicals cannot be accurately estimated, as there are neither detailed research on the extent of environmental and health impact nor any effective monitoring process in place (Oruonye and Okrikata, 2010).

In light of these uncertainties, scholars and non-governmental organizations (NGOs) in Nigeria have been advocating for organic agriculture as a sustainable alternative farming system (Philip and Dipeolu, 2010). Organic agriculture is a holistic production management system that avoids the use of synthetic chemicals, growth hormones, antibiotics and gene manipulation, while promoting improved precise standards of production that are socially and economically sustainable (IFOAM, 2008). It avoids the use of synthetic pesticides, herbicides, chemical fertilizers, growth hormones, antibiotics or gene manipulation. Instead, organic farmers use a range of techniques that help sustain ecosystems and reduce pollution. It dramatically reduces external inputs by refraining from the use of chemo-synthetic fertilizers, pesticides and pharmaceuticals. Instead, it allows the powerful laws of nature to increase both agricultural yields and disease resistance (Adeoye, 2005). According to the (UNCTAD-UNEP, 2008), organic agriculture has the potential to offer a range of local and national sustainable development opportunities for Africa in that it integrates traditional farming methods, uses inexpensive locally available natural resources and has positive economic effects on farmers' productivity and income.

Vegetables are a common crop in Nigeria, grown and consumed by different groups of farmers. According to Ayinde (1994), the system for sustainable vegetable production should increase the inherent productive capacity of natural and biological resources in step with demand. The use of chemicals in vegetable production has been identified as a major source of health risk and a cause of extensive environmental damage. According to Lumpkin (2005), food safety is a major concern as many of today's vegetable farmers inappropriately use toxic pesticides at pre- and post-harvest stages and this threatens the health of the farmer and consumers as well as contaminating the environment. Lumpkin argues that everyone (rich or poor), must have access to safe vegetables. The reduction of the use of chemical inputs through the adoption of organic agricultural production methods will help achieve these goals. In Nigeria however, organic agriculture had existed by default because of the unavailability and sparse use of chemical inputs by farmers. Others adopt the use of animal droppings as manure Dipeolu and Akinbode, (2005) and Dipeolu, Bello and Akinbode (2006). Indeed, Scialabba (2007) notes that non-certified organic systems (indigenous models that follow organic principles by intent or by default) of several million small farmers may represent at least an equivalent share in subsistence agriculture of developing countries. The most significant motive for choosing organic food is the health factor followed by the environmental and animal welfare factors. Some consumers buy organic food as they perceive a difference in food quality.

Some recent studies suggest that many supplying countries and farmers of organic produce face huge challenges in entering and benefitting from organic exports in a sustainable way (e.g. Kleemann *et al.*, 2014; Oelofse, *et al.*, 2010), hence this study is aimed at examining the extent of awareness of the respondents about organic vegetables, analyzing the factors affecting

consumers' willingness to pay for organic vegetables, ascertaining whether or not the respondents prefer organic over conventional vegetables, and determining the premium the respondents are willing to pay for organic vegetables

2.0 Research Method

2.1 Study area

The study was carried out in Ekiti State. Ekiti State is located in western Nigeria on coordinates $7^{\circ}40'N$ $5^{\circ}15'E$ / $7.667^{\circ}N$ $5.250^{\circ}E$ with a land area of $6,353\text{km}^2$ and population of 2,737,186 (NPC, 2006). Ekiti State has 16 Local Government Areas and enjoys tropical climate with two distinct seasons i.e. rainy and dry seasons. Temperature ranges between 21°C and 28°C with high humidity. The south westerly wind and the northeast trade winds blow in the rainy and dry (Harmattan) seasons respectively. Tropical forest exists in the south, while savannah occupies the northern peripheries.

2.2 Sampling technique

A multi-stage sampling technique was employed in the survey. At the first stage, purposive sampling technique was used to select three organizations in Ekiti State i.e Ekiti State University Ado-Ekiti, Federal Polytechnic Ado-Ekiti, and Ekiti State Government Secretariat, Ado-Ekiti. At the second stage, simple random sampling technique was used to select 20 respondents from each organization mentioned above, making the sample size to be 60.

2.3 Data source and collection

Primary data were sourced through a well-structured questionnaire designed to obtain information on the socioeconomic indices, information on consumer awareness, past experiences on organic products, buying preferences and willingness to pay premiums for selected organic vegetables. In addition, certain questions were designed to obtain the respondents' perceptions of organic vegetables over the conventional ones.

2.4 Data analysis

Descriptive statistics was used to analyze the socioeconomic characteristics of the respondents, the level of awareness of the consumers and preference of respondents regarding organic food using frequency tables and percentages. Since the data were censored on both sides (left and right), Tobit regression model was appropriate to estimate WTP. The left truncation is the starting bid, i.e, respondents who would indicate a zero WTP, while the right truncation is the highest bid that respondents were able to offer for organic vegetable.

Tobit regression model can be implicitly written as:

$$Y = \beta_0 + \beta_1 X_n + e_i$$

Where Y= willingness to pay (WTP)

β_0 = Intercept coefficient

β_1 = Slope coefficient

X_n = Independent variables

Explicitly:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + e_i$$

Y = Willingness to pay (number of organic vegetables bought by respondents divided by numbers of probable organic vegetables available for individual respondents)

X_1 =Awareness (Yes = 1, No = 0)

X_2 =Age (Years)

X_3 =Gender (male = 1, female = 0)

X_4 =Educational level (Non formal = 0, primary school = 1, secondary school = 2, tertiary institution= 3)
 X_5 =Working experience (years)
 X_6 = Monthly income (₦)
 X_7 = Household size (number)
 $\beta_1 - \beta_7$ = Regression coefficient of $X_1 - X_7$
 e_i = Error term

3.0 Results and discussion

3.1 Socioeconomic characteristics of the respondents

Table 1 revealed that majority (76.7%) of the respondents were male while 66.7% of them were married. Also, it showed that respondents with age between 31 – 35 and 25 – 30 accounted for 31.7% and 30.0% respectively. The result further disclosed that majority (81.7%) of the respondents had household size of 1 – 5 persons. Result on educational status of the respondents showed that 48.3% of them acquired B.Sc., 33.3% had Masters/PhD. Also, the table showed that 73.3% of the respondents earned less than ₦150,000 monthly while 56.7% of the respondents had between 1-5 years as working experience. The social group category was reported in multiple responses form where 70.0%, 53.3% and 50.0% belonged to cooperative society, religious association and professional association respectively.

Table 1: Socioeconomic characteristics of respondents.

Variables	Frequency	Percentage (%)
Gender		
Male	46	76.7
Female	14	23.3
Total	60	100.0
Age		
< 25	2	3.3
25 - 30	18	30.0
31 - 35	19	31.7
36 - 40	8	13.3
41 – Above	13	21.7
Total	60	100.0
Marital status		
Single	17	28.3
Married	40	66.7
Divorced	1	1.7
Widowed	2	3.3
Total	60	100.0
Household size		
1 – 5	49	81.7
6 – 10	8	13.3
11 – 15	3	5.0
Total	60	100.0
Educational level		
B.Sc	29	48.3

182	Masters/PhD	20	33.3
183	O.N.D	11	18.3
184	Total	60	100.0
185	Monthly income ('000₦)		
186	<150	44	73.3
187	150 - 300	10	16.7
188	301 - 450	6	10.0
189	Total	60	100.0
190	Working experience		
191	1 - 5	34	56.7
192	6 – 10	15	25.0
193	11 – 15	5	8.3
194	16 and above	6	10.0
195	Total	60	100.0
196	Social group		
197	Cooperative society	42	70.0
198	Religious association	32	53.3
199	Professional association	30	50.0
200	Social club	18	30.0
201	Political association	4	6.67

Source: Field Survey, 2017

3.2 Respondents' awareness of organic vegetables

Table 2 showed that majority (95.0%) of the respondents had prior knowledge of organic vegetables and had seen organic vegetables before. Also, 55.0% of the respondents revealed that they had seen organic vegetable for the first time between 2010 till date. The table further revealed that 91.7% of the respondents had eaten organic vegetables before and ate organic vegetables for the first time between 2010 till date. In addition, majority (90.0%) of the respondents had purchased organic vegetables before and 55.0% of them purchased it for the first time from 2010 till date. The table also revealed that 65.0% of the respondents first purchased organic vegetables in Ekiti State.

Table 2: Awareness of the respondents about organic vegetables

Variables	Frequency	Percentage (%)
Prior knowledge		
Yes	57	95.0
No	3	5.0
Total	60	100.0
Seen organic vegetables before		
Yes	57	95.0
No	3	5.0
Total	60	100.0
Year first seen		
Not seen before	4	6.7
Before 1990	11	18.3
1990 - 1999	5	8.3

228	2000 – 2009	7	11.7
229	2010 till date	33	55.0
230	Total	60	100.0
231	Eaten organic vegetables before		
232	Yes	55	91.7
233	No	5	8.3
234	Total	60	100.0
235	First time eaten		
236	Not eaten	4	6.7
237	Before 1990	11	18.3
238	1990 – 1999	5	8.3
239	2000 – 2009	7	11.7
240	2010 till date	33	55.0
241	Total	60	100.0
242	Purchased organic vegetables before		
243	Yes	54	90.0
244	No	6	10.0
245	Total	60	100.0
246	First time purchased		
247	Not purchased	6	10.0
248	Before 1990	9	15.0
249	1990 – 1999	5	8.3
250	2000 – 2009	7	11.7
251	2010 till date	33	55.0
252	Where respondents first purchased organic vegetables		
253	Not purchased before	6	10.0
254	Ekiti	39	65.0
255	Others	15	25.0
256	Total	60	100.0

Source: Field Survey, 2017

3.3 Perceptions on organic vegetables

Table 3 showed that 93.3% of the respondents agreed that organic vegetables were healthier than the conventional vegetables. It also showed that 83.3% supported that organic vegetables had higher nutritional value, 68.3% accepted that organic vegetables were tastier and 58.3% of the respondents said that organic vegetables were more expensive than conventional ones. In addition, 91.7% of the respondents agreed that organic vegetables were more beneficial to health and more environment friendly. The result further disclosed that 86.7% of the respondents said organic vegetables had longer shelf life whereas 63.3% agreed that organic vegetables were more readily available and 93.3% of the respondents concluded that organic vegetables had less or no chemicals.

Table 3: Perceptions about organic vegetable over conventional vegetables

Variables	Frequency	Percentage (%)
Healthier		
Yes	56	93.3
No	4	6.7
Total	60	100.0
Higher nutritional value		
Yes	53	88.3
No	7	11.7
Total	60	100.0
Tastier		
Yes	41	68.3
No	19	31.7
Total	60	100
More expensive		
Yes	35	58.3
No	25	41.7
Total	60	100.0
More beneficial to health		
Yes	55	91.7
No	5	8.3
Total	60	100.0
More environments friendly		
Yes	55	91.7
No	5	8.3
Total	60	100.0
Longer shelf life		
Yes	52	86.7
No	8	13.3
Total	60	100.0
Readily available		
Yes	38	63.3
No	22	36.7
Total	60	100.0
Less or no chemicals		
Yes	56	93.3
No	4	6.7
Total	60	100.0

Source: Field Survey, 2017

3.4 Factors influencing willingness to pay for organic vegetables

This section presents the results of Tobit model that showed how socio-economic characteristics of the farmers affected their willingness to pay for organic vegetables. Willingness was measured in terms of the number of organic vegetables bought by respondents divided by numbers of probable organic vegetables available for individual respondents. The likelihood estimates of the Tobit model indicated that chi-square (χ^2) statistic of 74 was highly significant ($P < 0.05$)

suggesting that the model has a strong explanatory power. The pseudo coefficient of multiple determination (R^2) showed that 65.38 percent variation in the dependent variable was explained by the included independent variables. This implies that the model showed a good fit to the data. The result revealed that household size, educational level and monthly income were statistically significant at 5%, 1% and 1% respectively, indicating that they were the variables determining willingness to pay for organic vegetables in the study area. The table also showed that household size and awareness of the respondents had a positive relationship with willingness to pay for organic vegetable, meaning that an increase in these positively signed variables would enhance willingness to pay for organic vegetables and vice-versa.

Table 4: Tobit Estimate of Factors Affecting Consumers' Willingness to Pay for Organic Vegetables

Willingness to pay (WTP)	Coefficient	Standard Error	t	P> t
Sex	-0.0114	0.1193	0.10	0.924
Age	-0.0681	0.0546	-1.25	0.218
Household size	0.2229**	0.1003	2.22	0.031
Educational level	-0.0594***	0.0219	-2.71	0.001
Monthly income	-0.0821***	0.0247	-3.32	0.001
Working experience	-0.0651	0.0840	-0.77	0.442
Awareness	0.3364	0.2374	1.42	0.162
Constant	0.9200**	0.4281	2.15	0.036

Source: Data Analysis, 2017

*** = significant at 1%

** = significant at 5%

LR $\chi^2 = 14.89$

Prob> $\chi^2 = 0.74$

Log likelihood = -33.066216

Pseudo $R^2 = 0.6538$

3.5 Summary statistics of premium paid for various organic vegetables

Table 5 revealed that the maximum premium respondents were willing to pay for okra and amaranthus was ₦100 while ₦150 was recorded for fluted pumpkin. The table also showed that the highest premiums respondents were willing to pay for tomato and pepper were ₦200 each while ₦500 for cucumber. The result further disclosed that the mean prices respondents were willing to pay for okra, amaranthus, fluted pumpkin, tomato, cucumber and pepper were ₦28.0, ₦28.83, ₦32.25, ₦45.25, ₦49.33 and ₦38.92 respectively.

Table 5: Premium for organic vegetables

Organic vegetable	Maximum (₦)	Minimum (₦)	Mean (₦)
Okra	100	0	28.0
Amaranthus	100	0	28.83
Fluted pumpkin	150	0	32.25
Tomato	200	0	45.25
Cucumber	500	0	49.33

361	Pepper	200	0	38.92
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362 **Source:** Field Survey, 2017.

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364 **4.0 Conclusion and recommendations**

365 **4.1 Conclusion**

366 The relevance of organic produce and consumer's WTP for the consumption of organic
 367 vegetable has been shown in this paper. Based on the findings of this study, it was concluded
 368 that; majority of the respondents were had prior knowledge of organic vegetables, and larger
 369 percent of them had married. It was also found that perceptions of consumers towards organic
 370 vegetable were positive revealing that organic vegetables were tastier, healthier, more
 371 environment friendly and had longer storability than the conventional vegetables which could be
 372 attributed to their high level of education. The study inferred that household size, educational
 373 level and monthly income were very influential in determining willingness to pay for organic
 374 vegetables in the study area.

375

376 **4.2 Recommendations**

377 Based on the findings of this study, the following recommendations are made:

- 378 1. The three tiers of government including the private sector should mount serious
 379 awareness campaigns to sensitize Nigerian populace on numerous benefits of organic
 380 farming especially on health, finance and environment as well as emphasize on its
 381 contributions in mitigation of climate change.
- 382 2. Government should build on indigenous knowledge in response and in partnership with
 383 farmers; and promote development of local and regional markets for organic products.
- 384 3. Training extension workers in organic food practices should be included in extension
 385 workers training programme curricula and researches on certified organic food should be
 386 included in the programmes of research institutes and universities in Nigeria.
- 387 4. Organic agriculture should be promoted to meet export and domestic needs as this will
 388 lessen poverty and ensure food security in Nigeria. This requires formulation of
 389 agricultural policies to enhance the promotion of organic agriculture in Nigeria.

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