Socio-Economic Characteristics of Vegetable Farmers and Adoption of Organic Farming Practices in Calabar Agricultural Zone

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ABSTRACT

The study determined the socio-economic characteristics of vegetable farmers and adoption of organic farming practices in Calabar agricultural zone. *Descriptive survey design was used for the study. The instrument used for data collection was a structured questionnaire and oral interview. The instrument was face and content validated by experts in the field. Data obtained were analysed using frequency counts, percentage, and mean and rankings analysis. Findings of the study revealed that socio-economic characteristics of vegetable farmers (Age, level of education, marital status, household size, land tenure right, income, years of experience, access to credit facility, extension VTSH, taboo, cost of adoption of organism, farming and Involvement in social organization significantly relates with their adoption of organic farming practices in the study area. It was recommended that s*ince *vegetable farmers' level of education was generally found to be relatively low, effort should be made by governmental and non-governmental agencies as well as other stakeholders in vegetable-producing settlements to organize and operationalize adult literacy programmes.*

KEYWORDS: Calabar agricultural zone, Socio-economic characteristics, vegetable farmers, organic farming practices

Introduction

Individuals and groups behave differently in given situations. This is due to differences in individual's or family's position in relation to others, based on income, education and occupation. Socio-economic characteristics influence peoples' behaviour and attitudes and have also been found to influence the decision to adopt technologies (Adesina & Baidu-Forson(1995), Adesope, Mathews-Njoku, Oguzor & Ugwuja(2012), Atibioke, Ogunlade, Abiodun, Ogundele, Omodara & Ade (2012), Fadare, Akerele & Toritseju(2011), Ghulam, Mumtaz, Muhammad(2011), Johan Toborn (2011), Onemolease & Alakpa(2009), Orebiyi, Benchendo & Onyeka(2007). However, Adesope et.al (2012) found that marital status was negatively correlated with adoption of organic farming practices. Generally, a person's marital status can either enhance or reduce adoption and use of technologies. Education brings about enlightenment and increases one's ability to receive, interpret, and assimilate information and is widely believed to have a positive impact on technology adoption.

Statement of the Problem

The growing crusade for the adoption of organic farming techniques is a response to the prevalent environmental problems, including soil and air pollution, contamination of water often associated with aquatic biodiversity loss, destruction of soil micro-organisms and the dangers posed to man and animals as a result of the continued use of inorganic, mostly chemical-based farming practices. The use of inorganic compounds such as chlorinated hydrocarbons, organo-phosphorus, phenoxine, DDT etc. to control pests and the application of acidic fertilizers has often caused more problems than the solutions they are purported to offer.

Purpose of the study

The general objective of this study was to examine the adoption of organic farming practices by vegetable farmers in Calabar Agricultural Zone of Cross River State. The specific objective of the study was to;

i. ascertain the socio-economic characteristics of vegetable farmers in the study area;

Research questions

Based on the problem identified, the following research questions were raised for the study;

i. What are the socio-economic characteristics of vegetable farmers in the study areas?

Research hypothesis

This study was based on the general hypothesis that:

i. There is no significant relationship between selected socio-economic characteristics of vegetable farmers and their adoption of organic farming practices in the study area.

REVIEW OF RELATED LITERATURE

Socio-Economic Characteristics of Vegetable Farmers

This review focuses on the following socio-economic characteristics of vegetable farmers; age, marital status, educational level, main occupation, income, farming experience, extension visit, land tenure status and involvement in organizations. Age is a strong predictor of involvement in vegetable production and adoption of agricultural innovations. For instance, middle aged women (41-51) have been found to be more involved in farming generally (Adesope et al, 2012), and vegetable production specifically (Abang, Idiong & Akpan, 2004, Odok & Agbachome, 2012). Similarly, age was found to have a negative and significant impact on adoption of conservation tillage, indicating that younger farmers are more likely to try innovations, have a lower risk aversion and longer planning horizon to justify investments in technologies whose benefits are realized over time (Kassie et al 2009). Finally, in a study of smallholder farmers in Kumasi, age was one of the main socio-economic factors found to influence the production efficiency of farmers (Adams, 2006).

Marital status: Marital status defines an individual's position in relation to others and also influences the individual's decision-making process. For instance, a married woman in the African culture does not have the power to make certain decisions without consulting with and

getting approval from her husband. Marital status is significantly related to farming practices and use of technologies (Atibioke et. al. 2012).

Level of education: Many research studies have shown a significant relationship between level of education and adoption (Atibioke et.al, 2012, Adesope et.al, 2012). In a review of 25 years of literature focussed on the adoption of agricultural best management practices (BMPs), educational levels is one of the variables found to be positively related to adoption rates (Prokopy, Floress, Klothor-Weinkauf & Baumgart-Getz (2008).

Notwithstanding, one of the studies reviewed showed a negative impact of level of education on technology adoption. Combining the technology adoption and labour allocation models to estimate the net effect of education on adoption of Genetically Modified (GM) crops and precision farming, Uematsu & Mishra (2010) found that formal education can be a barrier to technology adoption, especially for small-scale farmers who have higher tendency to work off-farm. They explained that highly educated farmers are more reliant on off-farm income and have fewer incentives to spend time on farming including technology adoption. Education brings enlightenment and increases one's ability to receive, interpret and assimilate information but higher education offers individuals opportunities to earn more income in off-farm operations and impedes technology adoption specifically and farming generally.

Main occupation: Farmers whose main occupation is farming devote their time and energy to farming and this affects the decision to adopt an innovation. The chance of adoption of IRM was found to increase with the number of household members who are involved in full time farming (Mignouna et.al 2011).

Farming experience: In Adesope et.al (2012), farming experience was found to negatively correlate with adoption of organic farming practices. This was attributed to the fact that farmers who have been long in the business are usually older, less educated and more resistant to change.

Extension Visit: Contact with extension provides opportunity for transfer of skill, knowledge and information which facilitate adoption. Extension service is a delivery system which bridges the gap between local farmers and researchers and has been found to play a significant role in promoting indigenous knowledge practices among cassava growers especially (Ofem, Angba & Ogbonna, 2008). Land Tenure Status: Kassie, et al. (2009) found that plot ownership has a positive impact on the decision to use compost and the decision to combine composting and tillaging.

Method

Research Design

The study was a descriptive survey. This design was deemed appropriate since the information needed is already on ground and cannot be manipulated.

Population of the Study

The study population comprised all the vegetable farmers in Calabar agricultural zone. Names of major vegetable sites were collected from the Cross River Agricultural Development Programme (CRADP) office of the Calabar zone. For the specific sites in the LGAs studied, data available at

the ADP, Calabar zone, indicates that there were four hundred and fifty-three (453) registered vegetable farmers in the area

Sample and Sampling Technique

Multi-stage sampling procedure was used to select zone, blocks, cells and individual farmers for the study. The blocks are the Local Government Areas under the zone while the cells refer to the communities in the different local government areas where vegetable is produced.

Research Instrument

The instrument used for data collection was a structured questionnaire and oral interview. The questionnaire was multi-scaled and designed mainly to obtain primary data. It contained fifty (52) research items developed based on the research objectives.

The questionnaire was divided into four (4) sections, labeled A-D, section 'A' was designed to elicit information on the socio-economic characteristics of the respondents while section B – D were structured to elicit responses for addressing the research questions and objectives. The questionnaire was administered directly by the researcher while the oral interviews were carried out by the researcher and some trained interviewers. No copy of the questionnaire was issued or completed on proxy as only respondents found at the time of investigation were used. Copies of completed questionnaire were collected by the researcher.

Reliability of the research Instrument

The reliability of the instrument was determined using a test retest technique. A pilot test was conducted with 10 percent (25) of the respondents. The respondents used for the exercise were randomly selected from vegetable farmers in a neutral site (CRUTECH) within the Calabar Agricultural Zone. Twenty-five (25) copies of the questionnaire were administered to the same respondents fortnightly. The scores of the first and second round were correlated using Pearson product movement correlation co-efficient.

Procedure for data analysis

Different statistical tools were used to analyze data generated from the study. Descriptive statistics such as frequency distributions, tables and percentages were used to present data on demographic variables and organic vegetable farming practices. Objectives one to five were analyzed using frequency counts, percentage, means and rankings.

The probit model was used to analyze the relationship between selected socio-economic characteristics of respondents and rate of adoption of organic vegetable farming practices.

Results and Discussion

Socioeconomic characteristics of respondents

TABLE 1: Distribution of respondents by age

Variable	L. G. A (Block)						Total	
(Age in years)	Cal. South		Cal. Municipal		Odukpani			
	F	%	F	%	F	%	F	%
Below 21	12	13.33	2	3.85	6	6.12	20	8.33
21 – 35	16	17.78	7	13.46	19	17.39	42	17.50
36 – 50	41	45.56	30	57.69	37	37.76	108	45.00
51 – 65	18	20.00	12	23.08	29	29.59	50	24.38
Above 65	3	3.33	1	1.92	7	7.12	11	4.59
Total	90	100	52	100	98	100	240	100

Source: Field Survey, 2014.

Key:

Cal. = Calabar

F = Frequency

% = Percentage.

Result in Table 1 shows the distribution of vegetable farmers according to age. It reveals that majority of the respondents were within the age range of 36 – 50 (45.00%) and 51-65 (24.58%). However, the least number of respondents were those above 65 years as this accounted for only 4.59 percent of the farmers. Based on this result, it could be concluded that vegetable farming in the study area is largely carried out by middle aged and fairly old people. This is in line with the findings of Abang et al. (2004), Adesope et. al. (2012) and Odok et. al. (2012) who found that middle aged women were more involved in farming and especially vegetable production. The reason for this, according to Thapa (2009) is that most parents prefer to send their young children or wards to school rather than engage them in vegetable farming, while very old people (65 years and above) are often too physically weak to participate in intensive farming activities.

The implication of this finding on adoption of farming practices is that because younger farmers who according to Kassie et al. (2009) are more likely to try innovations and have a lower risk aversion are not really involved in vegetable farming, the rate of adoption of organic vegetable farming practices may be low in the area.

TABLE 2: Distribution of Respondents by marital status

Variable	L. G. A (Block)						Total	
Marital status	Cal. South		Cal. Municipal		Odukpani			
	F	%	F	%	F	%	F	%
Single	26	28.89	9	17.31	18	18.37	53	22.08
Married	48	53.33	27	51.92	51	52.04	126	52.50
Divorced	2	2.22	9	17.31	13	13.27	24	10.00
Widowed	13	4.44	7	13.46	6	6.12	26	10.83
Separated	1	1.12	0	0	10	10.20	11	4.59
Total	90	100	52	100	98	100	240	100

Source: Field Survey, 2014.

Table 2 shows that a substantial proportion of the respondents were married (52.50%) and about 22.08% were single. The table further reveals that only 4.58% of the respondents were

separated. This result implies that vegetable production in the study area is dominated by the married people. The reason could be associated with the fact that married people, especially the women cultivate various types of vegetables to provide both food and income to support their families. This is in line with Setboonsarng (2006) who maintains that vegetable production in developing countries is carried out by couples who strive to meet family consumption needs, supplement family income and is a means of livelihood for many.

The implication of this finding is that because most of the respondents are married, they may not take the decision to adopt organic vegetable farming practices without their husbands' consent. Hence education and enlightenment campaigns should also be targeted at their spouses for it to be effective.

TABLE 3: Distribution of respondents by educational level

Variable	L. G. A (Block)						Total	
(educational	Cal. South		Cal. Municipal		Odukpani			
level)	F	%	F	%	F	%	F	%
Primary	28	31.11	19	36.54	22	22.45	69	28.75
Secondary	56	62.22	25	48.08	48	48.48	129	53.75
College	2	2.20	6	11.54	7	7.14	15	6.25
University	3	3.33	0	0	9	9.18	12	5.00
Vocational	1	1.11	2	3.85	6	6.12	9	3.75
None	0	0.0	0	0	6	6.12	6	12.50
Total	90	100	52	100	98	100	240	100

Source: Field Survey, 2014.

Result in Table 3 show the distribution of respondents according to their educational level. It reveals that majority of the respondents were secondary school certificate holders (53.75%), 28.75% have attended primary school, while a paltry 2.50% have never identified with any form of formal education. The result shows specifically that in Calabar South and Municipality, none of the respondents indicated that he/she has attended formal education (0.00%). Interestingly, no respondent in Calabar Municipality attended University (0.00%) education. This result indicates that vegetable farmers in the study area predominantly had secondary school as their highest level of education. This substantiates the findings of Uematsu & Mishra (2010) who found that the higher the educational level of a farmer, the higher the obstacle to adoption of technology as highly educated farmers maintain other sources of income and have fewer incentives to spend time on farming including technology adoption.

These results have a number of implications for the adoption of organic farming practices. First of all, since the farmers are not well-read, they are less likely to have opportunities to work off-farm. This will enhance the adoption of organic vegetable farming practices as farmers whose main occupation is farming according to Mignouna *et al.* (2011) devote their time and energy to farming and this affects the decision to adopt an innovation positively. On the other hand, because education brings about enlightenment and helps one to receive, interpret and assimilate information, farmers in the study area may not be familiar with the practices and benefits of organic farming.

TABLE 4: Distribution of respondents by occupation

Variable	L. G. A (Block)						Total	
	Cal. South		Cal. Municipal		Odukpani			
	F	%	F	%	F	%	F	%
Vegetable farming	90	100	52	100	87	86.78	229	95.42
Trading	89	96.67	31	59.62	79	80.61	197	82.03
Civil service	2	2.22	8	15.38	10	10.20	20	8.33
Others	0	0	3	5.77	5	5.10	8	3.33
Total	90	100	52	100	98	100	240	100

Source: Field Survey, 2014.

Table 4 shows that the respondents were largely vegetable farmers (95.42%). However, about 82.08% of them were involved in trading activities even as only 8.33% indicated that they were civil servants. The implication of this finding is that those who are involved in vegetable production in the area take the practice as their main occupation and are also engaged in trading business especially the marketing of vegetables. In other words, although vegetable farming represents the primary occupation of the people, they are also involved in trading activities.

TABLE 5: Distribution of respondents by annual income

Variable (Income in N)	L. G. A (Block) Cal. South		Cal. Municipal		Odukpani		Total	
	F	%	F	%	F	%	F	%
Less than 20,000	31	34.44	23	44.23	37	37.76	91	37.92
20,000 – 40,000	48	53.33	19	36.54	42	42.86	109	45.42
40,000 -60,000	11	12.22	8	15.38	15	15.31	34	14.17
Above 60,000	0	0	2	3.85	4	4.08	6	2.50
Total	90	100	52	100	98	100	240	100

Source: Field Survey, 2014

Result in Table 5 show the annual income earned by vegetable farmers in the study area. It reveals that a good number of the respondents earned between 20,000 – 40,000 naira (45.42%) annually. The table also indicates that about 37.92% of the respondents earned less than 20,000 per annum even as a paltry 2.50% earned above 60,000 annually. In particular, no respondent in Calabar South Local Government Area earned above 60,000 (0.00%) even though only 3.85% of their counterparts in Calabar Municipality earned above 60,000 per year. The implication of this result is that a substantial proportion of vegetable farmers in Calabar Agricultural Zone of the state are generally low to middle income earners, which could impact in a number of ways on their ability to adopt organic farming practices.

TABLE 6: Distribution of respondents by farming experience

Variable (Farming experiences in years)	L. G. A (Block) Cal. South		Cal. Municipal		Odukpani		Total	
	F	%	F	%	F	%	F	%
Less than 10	37	41.11	33	63.46	43	43.33	113	47.08
10 – 20	49	54.44	17	32.69	36	36.73	102	42.50
21 – 31	4	4.44	2	3.85	14	14.29	20	8.33
31 and above	0	0	0	0	5	5.10	5	2.09
Total	90	100	52	100	98	100	240	100

Source: Field Survey, 2014.

Table 6 shows the distribution of respondents according to farming experience. It indicates that a substantial proportion of the respondents have spent less than 10 years (47.08%) cultivating vegetables, while 42.50% have been involved in vegetable production between 10 and 20 years. Specific trends in the result show however that no respondent in Calabar South and Calabar Municipality has spent 31 years and above producing vegetable (0.00%), even though about 5.10 percent of their counterparts in Odukpani L.G.A. have been engaged in vegetable production for 31 years and above. On the basis of this result, it could be assumed that majority of the

vegetable farmers in Calabar Agricultural Zone have not accumulated many years of experience as vegetable farmers, having been involved in vegetable farming for just less than 10 years.

The implication of this finding on the rate of adoption of organic vegetable farming practices, according to Farnworth et al. (2009) and Maity et al. (2009) is that less experienced farmers are unlikely to be conversant with the various organic farming practices and as expected, could hardly adopt them. Setboonsarng (2006) however disagrees, arguing that farming experience, all things being equal, may not play any significant role in determining the rate of adoption of organic farming. They insist that education, extension contact and resources availability play more prominent role in influencing farmers' decision to adopt organic farming than merely accumulating farming experience.

TABLE 7.1: Distribution of respondents by extension visit/contact

Variable	L. G. A (Block)						Total	
(extension	Cal. South		Cal. Municipal		Odukpani			
visits/contact)	F	%	F	%	F	%	F	%
Yes	21	23.33	12	23.03	36	36.73	69	28.75
No	69	76.67	40	76.92	62	63.27	171	71.25
Total	90	100	52	100	98	100	240	100

Source: Field Survey, 2014.

Results in Table 7.1 show the percentage distribution of vegetables farmers according to extension visit/contact. The result shows that majority of the respondents (71.25%) had no extension visit/contact, while only 28.75% of them indicated that they had contact with extension services. This result indicates generally that vegetable farmers in Calabar Agricultural Zone are hardly captured by extension activities.

TABLE 7.2
Distribution of respondents by frequency of extension visit/contact

Variable	Cal. South		Cal.Mun.		Odukpani		Total	
	F	%	F	%	F	%	F	%
Weekly	2	9.52	6	50.00	13	36.11	21	30.45
Monthly	6	28.57	0	0.00	8	22.22	14	20.29
Quarterly	9	42.86	6	50.00	5	13.89	20	28.99
Annually	4	19.05	0	0.00	10	27.78	14	20.29

Source: Field Survey, 2014

Table 7.2 shows the frequency of extension visit/contact. It revealed that 30.43% of the vegetable farmers were visited weekly by an extension agent, 28.99% were visited quarterly while 20.29% were visited monthly and annually.

The implication of this finding for the rate of adoption of organic vegetable farming practices in the area is that farmers are less likely to practice organic farming given that the extension agents who are supposedly charged with the responsibility of enlightening farmers on the benefits of organic farming have overlooked vegetable farmers in extension services. Besides, it is the duty

of extension to teach farmers and carryout demonstration trials on organic farming practices and carefully guide, help or persuade farmers to adopt these practices/techniques. When farmers are sidelined by the extension agents, as expected they would rely on the much-vaunted chemical fertilizers to quicken vegetable growth. This finding corroborates the result of studies by FAO (2009) and Farnworth (2009).

TABLE 8: Distribution of respondents by source of information

Variable	L. G. A (Block)						Total	
(source of	Cal. South		Cal. Municipal		Odukpani			
information)	F	%	F	%	F	%	F	%
Neighbours	42	46.67	19	36.54	68	59.39	129	53.74
Extension agent	6	6.67	0	0	2	2.04	8	3.33
Radio	9	10.00	18	34.62	0	0	27	11.25
Television	12	14.44	20	38.46	26	26.53	59	24.58
Newspapers	12	23.33	11	21.15	17	17.35	49	20.42
Total	90	100	52	100	98	100	240	100

Source: Field Survey, 2014.

Results in Table 8 shows that 53.74% of the respondents obtained information about organic farming practices from friends, relatives and neighbours, 24.58% obtained information through the television, 20.42% through the newspapers, while a paltry 3.33% indicated that they obtained information about organic vegetable farming practices from extension agents. A specific trend in the result reveals that no respondent in Calabar Municipality got information from extension agent even as none in Odukpani got information about organic farming through the radio. This result implies generally that vegetable farmers in the study area acquired information on organic farming mainly through informal sources notably friends, families and neighbours. Again, it implies that organic farming in Calabar Agricultural Zone of the state has not received the attention of formal information custodians particularly the extension agents, radio, television and the print media.

This has a number of implications for the rate of adoption of organic vegetable farming practices. In the first instance, studies by FAO (2009) and Scialabba (2007) have shown that informal sources of knowledge especially agricultural practices are not effective in persuading farmers to change existing methods or adjust to alternative procedures of farming. In the light of these submissions, it could be concluded that the rate of adoption of organic farming in the study area is scarcely encouraging given that informal agricultural news vendors (friends, families, neighbours etc), often considered gossips, rumours and lies etc. have hardly offered any promising avenue to effect sustainable changes in farming attitudes especially in contemporary times.

TABLE 9: Distribution of respondents by land tenure status

Variable	L. G. A (Block)	Total

(land tenure status)	Cal. South		Cal. Municipal		Odukpani			
	F	%	F	%	F	%	F	%
Inheritance	77	85.56	26	50.00	82	83.67	185	77.08
Communal ownership	20	22.22	31	59.62	65	66.66	116	48.33
Leasehold	53	58.89	19	36.54	47	47.96	119	49.58
Purchase/bought	0	0	0	0	8	8.16	8	3.33
Tenancy the will of government	0	0	0	0	0	0	0	0
Total	90	100	52	100	98	100	240	100

Source: Field Survey, 2014.

Results in Table 9 show that inheritance is the main system of land ownership (tenure) in the area as this accounted for 77.08% of the respondents. This was followed by leasehold tenure system which represented 49.58% of the population, communal ownership system accounted for 48.33% of vegetable farmers in the area. However, the result reveals that purchase/bought land was rarely used by the respondents even as tenure at the will of government was not popular among vegetable farmers in the area.

The implication of this finding is that farmers in the area grow vegetable largely on lands handed down to them by their parents and fore-fathers, and as observed, many of them probably do not have the money to buy land, hence only 3.32% of the respondents utilized bought lands. Inherited lands are often fixed and cannot be expanded beyond the boundaries inherited unlike communal tenure, leasehold or purchase lands that can be expanded based on negotiations, need and ability to pay the rent. The implication of this for the adoption of organic farming practices/technologies is that farmers cannot readily adopt techniques that will require expansion of production since they are constrained by the type of land holding system prevalent in the area. This is because small land holdings and widely dispersed farms due to fragmented land holdings according to Khan, Ahmad and Amjad (2012) hinder farmers from converting from conventional farming to organic farming. Also, inherited lands are often owned by the family rather than an individual, hence farmers seldom enjoy flexibility in utilizing the land the way they want, but are subject to family control/prescriptions on land utilization which often limit the adoption of organic farming technologies.

TABLE 10: Distribution of respondents based on involvement in social organization

Variable	L. G. A (Block)						Total	
	Cal. South		Cal. Municipal		Odukpani			
	F	%	F	%	F	%	F	%
Age grade cooperative	48	53.33	11	21.15	53	54.08	112	46.67
Society	83	92.22	42	80.77	86	87.76	211	87.92
Farmer club association /Union	20	22.22	26	50.00	30	30.61	76	31.67
Religious group	87	96.67	49	94.23	92	93.88	228	95.00
Others	13	14.44	6	11.54	17	17.35	36	15.00
Total	90	100	52	100	98	100	240	100

Source: Field Survey, 2014.

Table 10 shows that the respondents were members of a wide range of social organizations. In particular, majority of them belonged to different religious groups (95.00%), cooperative society (87.92%) and age grade (46.67%). However, only 31.67% of the respondents were members of farmer clubs/associations/union, and only a small 15.00% were involved in other social organizations. This result could have several implications for the rate of adoption of organic farming practices/technologies in the area. Farmers' social disposition towards farming techniques and innovation is generally influenced by the social environment to which they belong. Group sets standards, rules and regulations for members and members' acceptance of organic farming technologies like other farming techniques could be subject to both direct and indirect control by the social group that the farmer belongs. If the group opposes the adoption of any farming practice, rarely would its members adopt that particular farming practice. For example, Reed et al (2006) observed that if a farmer approaches his/her social group (e.g. age grade, cooperative etc.) for financial assistance to purchase organic input, whether or not the group would offer such assistance depends in part on whether such a practice (input or technology) is sanctioned by the group. On the other hand, Babeleye (2003) argues that farmers membership/involvement in social organization (for example, the cooperative society) could provide the necessary capital and assistance required for the adoption of organic farming practices to its members which would serve as incentive to production. It could be concluded that involvement in social organization has both negative and positive implications for the rate of adoption of organic farming practices. Positive when the social organizations encourage or promotes the adoption of organic farming and negative when it hinders the adoption of organic farming practices.

Hypothesis testing

HO**:** There is no significant relationship between selected socio-economic characteristics of vegetable farmers and their adoption of organic farming practices in the study area.

Table 18 shows the empirical estimation of the probit analysis result. It reveals a log likelihood of -96.160222, Pseudo R^2 of 0.0875 and LR statistic of 18.44, all significant at 5% probability level; this shows that the model has a good fit. Considering P>121 values for all the variables included in the model as shown in table 17, only X_3, X_4, X_9 and X_{10} are significant and they are all significant at 5% level; having confidence interval of 95% each. The implication of these from the finding is that increase in the level of any of the explanatory variables with positive sign, X_{10} in this case will have a positive effect on the adoption of organic farming practices by vegetable farmers, whereas those explanatory variables with negative sign, X_3, X_4, and X_9 will exert a negative relationship on vegetable farmers' adoption of organic vegetable farming practices.

TABLE 11: Probit Estimates of selected socio-economic determinants of adoption of organic farming by vegetable farmers

Variables	**Coefficient**	**Standard Error**	**Z=statistics**	**P-value**
Constant	**1.797291**	**1.1019832**	**1.76**	**0.078**
Age (X_1)	-0.017307	0.0216464	-0.80	0.422
Level of Edu (X_2)	0.2279989	0.1708957	1.33	0.182
Marital Status (X_3)	-0.5673548	0.277094	-2.05	0.041**
Household size (X_4)	-0.5683947	0.266075	-2.07	0.051**

Land tenure right (X_5)	-0.0730558	0.2783172	-0.26	0.793
Income (X_6)	8.09e-08	2.12e-06	0.04	0.970
Years of Exp. (X_4)	0.1143045	0.1664658	0.69	0.492
Access to Credit facility (X_7)	0.3985417	0.2938333	1.36	0.175
Extension VTSH (X_9)	-0.3293294	0.170241	-1.93	0.053**
Taboo (X_{10})	1.797291	0.3126904	2.19	0.029**
Cost of adoption of org. Farming (X_{10})	-0.0363675	0.194804	-0.19	0.852
Involvement in social Organization (X_{12})	0.0176362	0.2374244	0.07	0.941

Prob > Chi^2	=	0.0719
Log – Likelihood Ratio	=	-96.160222
Pseudo R^2	=	0.0875
LR Statistic	=	18.44

** Significant at 5%
* Significant at 10%

However, taboo (X_{10}) being positive and significant at 5 percent indicates that, it is a strong factor in determining adoption of organic farming practices by vegetable farmers; although its coefficient being positive is contrary to apriority expectation because it is expected to be contributing negatively to adoption of organic farming. The positive sign could be attributed to more emphasis being placed on both vegetable and livestock production other than one production system – to provide alternative source of manure, income and for the increasing deconstruction of traditional and cultural walls that hitherto surrounded farmers as a result of Western education, urbanization and civilization. However, household size (X_4) and marital status (X_3) are negatively significant at 5% 0'level respectively. This means that, they are both important factors in influencing vegetable farmers' adoption decisions towards organic farming practices, but their negative coefficients is at variance with a-priori expectations and findings of Damisa et al. (2007) and Williams (2003) because, household size should measure number of working members; generally, an increase in family size is likely to increase the probability of having more people involved in vegetable production thereby increasing the propensity to adopt organic vegetable farming practices; all things being equal; this probably means that younger members of the households are not involved in vegetable production because, according to Shawn (2008) youths of modern days prefer white-collar jobs.

In the same vein, most of the respondents are married and as such marital status has a direct relationship with household size. The result indicates that a unit increase in marital status of farmers will result in a decrease in the probability of adopting organic farming practices. Extension visit (X_9) was negative but significant at 5% level. This implies that, extension visit has negative influence on adoption of organic vegetable farming practices. The negative sign is again surprising and indifferent to a-priori expectation because ordinarily, it is expected that increase in extension visit will increase adoption of organic farming since extension agents are supposed to teach and demonstrate to the farmers the benefits of organic farming. The negative sign could presumably be associated with the lackluster disposition of the government and extension services towards vegetable farming and more so towards organic agriculture. All other estimated variables, that is: X_1, X_2, X_5, X_6, X_7, X_8, X_{11}, X_{12} were found to have no significant

statistical effect on the dependent variable. This implies that the adoption or not of organic farming by vegetable farmers in the study area was not accounted for or influenced by these variables.

In conclusion, some of these findings are contrary to a-priori expectations and findings of Oni (2009) and Damisa et al. (2007) but may be explained by insincerity on the part of the respondents; thinking that, government inadequacies could better be expressed by inaccurate responses. Poor record keeping and the use of memory estimates by the respondents also contributed to the little deviation from the a-priori expectations experienced.

Conclusion

Vegetable generally are staple food of average household (especially for the urban and rural poor household) in Nigeria. Vegetables or its derivatives form a cardinal part of daily food for both poor and non-poor households and plays important social, medicinal and economic roles in the lives of citizens in Calabar Agricultural Zone. The marital status of farmers, household size, extension visits/content and taboo were also indicated as important socio-economic determinants of adoption of organic farming practices by vegetable farmers in the study area. Despite the importance of organic farming, the adoption of organic farming practices by vegetable farmers in Calabar Agricultural Zone was found to be relatively fair.

Recommendation

The following recommendations were made based on the findings of the study.

i. Since vegetable farmers' level of education was generally found to be relatively low, effort should be made by governmental and non-governmental agencies as well as other stakeholders in vegetable-producing settlements to organize and operationalize adult literacy programmes. This is necessary because majority of the farmers had only primary and secondary school education which makes it difficult for them to acknowledge the environmental and agricultural importance of organic farming.

ii. It is also very important to note that vegetable farmer mass education should be incorporated into the state and national extension programmes.

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