



ANALYSIS OF SMALL-SCALE FARMER'S INCOME IN MELON PRODUCTION IN DELTA STATE, NIGERIA

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ABSTRACT

The study analyzed the small-scale farmers' income in melon production in Delta State, Nigeria. Specific issues examined were the socio-economic characteristics of melon farmers in the study area, identified the farmers' major sources of information in melon production and identified the possible constraints faced by respondents in melon production in the study area. Multi-stage sampling technique comprising of purposive and random sampling was used to select 110 respondents. Data collected were analyzed using frequency count, mean and percentage while the Chi-square and Friedman test were used to test the hypotheses. The result showed that majority (69.1%) fell into the model class of 41 years and above having a mean of 47.2 years, 50.0% had a melon farming experience of 6 -10 years with the mean farming experience being 9.4, 52.7% had 6-10 members with a men household size of 9.7 members. The respondents mean annual income from melon farming was ₦28,640.90 and majority (74.5%) of the melon farmers studied do not belong to any farmers' association. 100% of the respondents' source information on melon farming from fellow farmers. Poor capital (mean = 3.50), inadequate extension services (mean = 3.50) pest and disease problem (mean = 3.41) and lack of improved seeds (mean = 3.32) were the serious constraints faced by respondents in melon production. Significant relationship existed between respondents between respondents' age ($x^2 = 44.569$; $P < 0.05$), level of education ($x^2 = 15.721$; $P < 0.05$), melon farming experience ($x^2 = 4.842$; $P < 0.05$), household size ($x^2 = 9.430$; $P < 0.05$), association membership ($x^2 = 20.621$; $P < 0.05$) and the farmers income derived from melon farming. It was concluded that melon production in the study area was constrained by several factors such as poor capital, inadequate extension, problem of pest and diseases, lack of improved varieties that are capable of reducing the farmers production output and make farmers reduce their interest in the production of the crop. It was recommended that agricultural extension agencies in the state should target melon farmers in the study area should target melon farmers in the study area with special training programmes.

Keyword: Delta State, Farmers, Income, Melon production, Small-scale.

INTRODUCTION

Melon is a recognized and a wide spread annual crop cultivated in Nigeria, Ghana, Togo and Benin as well as other African countries because of its nutritional roles as well as medicinal purposes (Achingan-Dako *et al.*, 2008). The crop is highly valued for the reason that the seeds are rich sources of oil, protein, minerals and carbohydrate, as well as other medicinal relevance of the young fruit, seed coat and root, which were said to heal stomach aches and epilepsy in addition to the roasted seeds mixed with salt that stops vomiting among farmers in Republic of



Benin (Sadiq *et al.*, 2013). Olaniyi (2008) reported that melon seeds of contained 4.6g carbohydrate, 0.6g protein, 0.6g crude fibre, 33mg vitamin C, 17g Ca, 16mg P and 230mg per edible seed. Therefore, melon could be an important instrument to fight against malnutrition and food insecurity (Agba *et al.*, 2009).

Agricultural production in Nigeria has been criticized for poor performance, low yield and small scale production resulting from lack improved farm technologies, poor capital, poor extension services as well as unavailability of improved seeds. It is worthy of note, that melon is not an exception in this regard. Irrespective of the nutritional and economic benefits of melon in Nigeria, Abiola and Daniel (2014) noted that its cultivation has not significantly increased because of several constraints limiting its production. However, no research has been conducted in the study area to find the possible factors militating against its production. The study therefore seeks to; examine the socio-economic characteristics of melon farmer in Delta State; identify the farmers' major sources of information on melon farming and ascertain the constraints faced by respondents in melon production, so as to provide baseline information on the current state of melon production in the study area. This information will be useful for the government and extension agencies in case of intervention projects that could improve melon production in the study area.

The following hypotheses were tested in the study:

Ho¹: There is no significant relationship between farmers' socio-economic characteristics and the income derived from melon farming.

Ho²: There is no significant difference among the constraints faced the respondents in melon production improved melon production technology.

MATERIALS AND METHODS

The Study Area

The study was carried out in Delta State, Nigeria, located in the South-South geo political zone of the country. It lies roughly between longitude 5⁰ .00'' and 6⁰ .45'' and shares common boundaries with Edo to the North, Bight of Benin to the South West, Ondo to the North West, Imo and Anambra to the East, Bayelsa to the South and Rivers to the South East respectively (Delta State Agricultural Policy, 2007). Delta State has a population of 4098391 (NPC, 2006). The state is generally low-lying and has a deep coastal belt inter-laced with rivulets and streams which form the Niger Delta. The Atlantic Ocean forms its southern boundaries with coast line of 160 kilometers. It covers a land mass of 17,698 square kilometers. The traditional income generating activities of the people are crop farming, fish farming, lumbering, weaving, canoe and pot making (Delta State Monthly Planner, 2013).

Sampling Techniques

The study is limited to the factors affecting melon production in Delta State. The main instruments for data collection were questionnaires and interview schedule. Multi-state sampling technique was used to select 110 respondents (Table 1). The first state involved a purposive selection of Delta North agricultural (selection based on the presence of melon farmers), the second stage involved a purposive selection of three local government area local government area (LGAs) (selection based on high intensity of melon farming), and the third stage involved purposive selection of 11 communities across the selected LGAs. At fourth and final stage, random sampling technique was used to select 110 respondents across the communities to ensure an accurate representation of the communities. The constraints faced by respondents in melon production were determined using a four-point Likert scale measured as



follows: very serious (coded 4), serious (coded 3), less serious (coded 2) and not serious coded (coded 1). The extent of seriousness was determined using a mean score of 2.50 computed as follows: $4+3+2+1 \div 4 = 2.50$. Any constraints with ≥ 2.50 were regarded as serious while constraints with mean < 2.50 were regarded as not serious. Proportionate random sampling was adopted to ensure an unbiased selection of the respondents across the various locations. Okobia (2007) noted that random sampling eliminates bias by giving all the individuals equal chance to be selected.

Table 1: Sampling Frame and Size Selection Plan

Zone (Purposive)	LGAs (Purposive)	Communities (Purposive)	Sample (Random)
Delta North	Ika North	Owa-Alero	10
		Ute-Okpu	10
		Idumuesah	10
		Owa-Oyibu	10
	Ika South	Abavo	10
		Ekuku-Agbor	10
		Agbor-Nta	10
		Obi- Agbor	10
	Aniocha South	Ejeme-Aniogor	10
		Nsukwa	10
		Otulu	10
Total	3	11	110

Source: Field survey, 2017

Analytical Techniques

The test-re-test method of establishing reliability of scale was equally adopted. A correlation coefficient of 0.755 was obtained indicating the reliability of the instrument. Data were analyzed using descriptive statistical tools such as frequency, percentage and mean while Chi Square and Freidman test was used to analyze the hypotheses. The Friedman test was used to find out if there were differences among the various constraints affecting melon production, as such, frequencies and percentages of these various factors were not made available in Table 6. Hence, the frequencies and percentages of the same factors according to their level of seriousness were made available in Table 4.

RESULTS AND DISCUSSION

The findings on farmers' socio economic characteristics are presented in Table 2. The result shows that a majority (69.1%) fell into the model class of 41 years and above having a mean of 47.2 years. This is an indication that melon farmers in the study area were in the active age bracket. Most (85.5%) of the respondents were married, suggesting a good sense of family responsibility. The farmers were quite educated with 71.9% having formal education. Having formal education could positively influence farmers' production. Oriakhi and Okoedo-Okojie (2013) confirmed that education facilitates farmers' ability to work with new ideas such as agricultural information that can boost their production. A higher proportion (50.0%) had a melon farming experience of 6 -10 years with the mean farming experience being 9.4.



Table 2: Socio-economic Characteristics of the Respondents (n = 110)

Variables	Frequency	Percentage	Mean
Age (years)			
21-30	8	7.3	
31-40	26	23.6	47.2
41 and above	76	69.1	
Sex			
Male	94	85.5	
Female	16	14.5	
Marital status			
Married	79	71.8	
Single	21	19.1	
Divorced/separated	6	5.5	
Widow/widower	4	3.6	
Level of formal education			
No formal education	31	28.1	
Primary education	32	29.9	
Secondary education	36	32.0	
Post-secondary education	11	10.0	
Farming experience (years)			
5 and below	12	10.9	
6-10	55	50.0	9.4
11 and above	43	39.1	
Household size			
1-5	12	10.9	
6-10	58	52.7	
11-15	28	25.5	9.7
Above 15	12	10.9	
5 and above	14	17.5	
Income range (₦/per annum)			
20,000 and below	16	14.4	
21,000 -30,000	47	42.3	28,640.90
31,000 and Above	48	43.2	
Membership of Association			
Yes	28	25.5	
No	83	74.5	

Source: Field survey data, 2018

This result suggests that the respondents had some experience in farming. This experience would be relevant to the respondent in making useful decision regarding their farm operation especially in the adoption of improved farm practices. Similar study was conducted by Adojutelegan *et al.* (2015) and reported a mean farming experience of 10 years for farmers in Ekiti State, Nigeria. The result on household size revealed that most (52.7%) had 6-10 members with a men household size of 9.7 members. This shows that the household size of the respondent was large and as such the pressure on paid labour will be reduced as the respondents



could rely on family labour. Mean income of the respondents from melon farming was ₦28,640.90, suggesting that the farmers' income was low especially when compared with the National minimum wage of ₦18,000 as at the time of the study. Majority (74.5%) of the melon farmers studied do not belong to any farmers' association. This may reduce their chances of seeking for loan financial institution and governments grants.

Sources of Information in Melon Farming

The sources of information on melon farming presented in Table 3 indicated that all the respondents (100%) sourced their information for melon farming from fellow farmers, 32.7% sourced their information from private farm input sales agent, 24.5% got their information from the Agricultural Development Programme (ADP), 22.5 got their information from the Ministry of Agriculture while 7.2% and 4.5% sourced their information from media (radio/television), respectively. This result suggests that there is a high flow of information from farmer to farmer. Antholt (1994), however, stated that the rise in farmers preferring fellow farmers as source of information.

Table 3: Sources of Information of the Respondents

Sources	Frequency	Percentage
Fellow farmers	110*	100
Private farm input sales agents	36	32.7
ADP	27	24.5
Ministry of agriculture	25	22.7
Media (radio/television)	8	7.2
Magazine	5	4.5

Multiple responses existed.

Source: Field survey data, 2018

Constraints faced by Respondents in Melon Production

The constraints faced by respondents were presented in Table 4. As reported, the constraints with mean 2.50 and above were regarded as serious constraint. The result shows that constraints such as poor capital (mean = 3.50), inadequate extension services (mean = 3.50) pest and disease problem (mean = 3.41) and lack of improved seeds (mean = 3.32) were the serious constraints faced by respondents in melon production in the study area. Constraints such as poor access to farm inputs (mean = 2.23), unavailability of arable (mean=1.94), poor processing facilities (mean = 1.80) and government policies (mean = 1.74) were regarded not to be serious because they fell below the bench mark of 2.50. Alakpa and Onemolease (2014) reported that several factors affect food crop production in Nigeria; among them are insufficient capital, poor extension services, and pest and disease problems.



Table 4: Constraints faced by the Respondents in Melon Production

Constraints	Very serious		Serious		Less serious		Not serious		Mean
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Poor capital	52	46.8	31	27.9	16	14.4	11	9.09	3.50
Inadequate extension services	52	46.8	31	27.9	16	14.4	11	9.09	3.50
Problem of pest and diseases	48	43.2	31	27.9	19	17.1	12	10.8	3.41
Lack of improved varieties	44	39.6	31	27.9	21	18.9	13	12.6	3.32
Poor access to farm inputs	8	7.3	32	29.1	48	43.6	22	20.0	2.23
Unavailability of arable land	4	3.6	24	21.8	22	20.0	60	54.5	1.94
Poor processing facilities	4	3.6	18	16.4	40	36.4	48	43.6	1.80
Government policies	0	0	24	21.8	34	30.0	52	47.3	1.74

*Serious (mean = 2.50)

Source: Field survey data, 2018

Farmers’ Socio-economic Characteristics and Income Derived from Melon Farming

Ho¹: There is no significant relationship between farmers’ socio-economic characteristics and the income derived from melon farming. The Chi-square model was employed to analyze the hypothesis. The result (Table 5) revealed that significant relationship existed between respondents between respondents’ age ($x^2 = 44.569$; $P < 0.05$), level of education ($x^2 = 15.721$; $P < 0.05$), melon farming experience ($x^2 = 4.842$; $P < 0.05$), household size ($x^2 = 9.430$; $P < 0.05$), association membership ($x^2 = 20.621$; $P < 0.05$) and the farmers income derived from melon farming. Sex ($x^2 = 0.125$; $P < 0.05$) and marital status had $x^2 = 1.972$; $P < 0.05$ implying had no significant relationship with the farmers income derived melon farming in the study area. A possible explanation of a significant relationship between age and income could be that younger farmers have the required energy needed for melon production. Oladele (2005) had noted when provided with appropriate technologies as recommended these able-bodied persons to have the competence or strength to produce food and other agricultural products for both household consumption and for commercial purpose, thus improving their living standard and enhancing national development. A likely reason for the significant relationship between farmers’ education and their income could be that the educated farmers may have gotten access to relevant information on melon production which may have influenced their production. It could equally be that the educated farmers may have been employed in other well-paid jobs were they earn better money that could positively influence their capital base. Alakpa and Onemolease (2014) reported a significant relationship between maize farmers’ education and the adoption of improved production technologies that enhanced their income. For farming experience, it is possible that the experienced farmers may have gathered some experiences over time which influenced in the production. A possible reason the significant relationship between household size and income could be that farmers with large household size are likely



to cultivate large expanse of land, produce more and consequently earn more income. A significant relationship between household size and farmers’ income was reported by Sodiya (2013). On association membership, there is the likelihood that farmers who belonged to association were able to raise capital that will increase their farm size and their production capacity. Group formation has been recommended as for farmers as a mean of raising capital from financial institution and seeking government grant (Onyemekonwu, 2018).

Table 5: Relationship between Farmers’ Socio-economic Characteristics and Income Derived from Melon Farming

	Chi-Square	Df	P = value	Decision
Age	44.569	4	0.001*	Significant
Sex	1.815	1	0.125	Not significant
Marital status	1.972	3	0.57	Not significant
Level of formal education	15.271	3	.001*	Significant
Melon farming experience	4.842	2	.002*	Significant
Household size	9.430	3	.001*	Significant
Membership of Association	20.621	1	.000*	Significant

Note: * Significant at 5% (P<0.05)

Source: Field survey data, 2018

Ho²: There is no significant difference among the constraints faced the respondents in melon production improved melon production technology.

Test of Difference among the Constraints in Melon Production

The Friedman test was employed to test the above hypothesis and presented in Table 6. The chi-square result ($\chi^2 = 5.841$, $df = 7$) revealed that significant differences existed among the constraints affecting respondents in melon production in the study area. The post hoc test revealed that the most significant constraints affecting melon farmers were poor capital (mean = 3.50) and inadequate extension services (mean = 3.50) and they were significantly different in affecting famers in melon production compared to other factors.

Table 6: Test of Difference among the Constraints faced the Respondents in Melon Production

Constraints	Mean
Poor capital	3.50 ^a
Inadequate extension services	3.50 ^a
Problem of pest and diseases	3.41 ^b
Lack of improved varieties	3.32 ^b
Poor access to farm inputs	2.23 ^{bc}
Unavailability of arable land	1.94 ^c
Poor processing facilities	1.80 ^c
Government policies	1.74 ^d

Source: Field survey data, 2018

However the least significant factor affecting melon production in the study area was government policy (mean = 1.74). This result suggests that the level at which these constraint



affect the farmers in their production differs. Constraints such as poor capital and inadequate extension services are more likely to affect the farmers in their production as they were more significant compared to others factors. It is possible that the farmers had no access to credit facilities and could not cultivate larger farm size due to the lack of needed finance to purchase land. The implication of this is that the farmers are most likely to remain in small scale production. Also, the extension agency in the study area may not have targeted melon farmers. This may likely force most farmers out of production as most farmers may rely on their indigenous farm practices that yield low output. Similar result was reported by Onyemekonwu (2018) who reported that significant difference existed among the constraints affecting farmers in watermelon production in Delta State. As earlier reported under the analytical techniques, the Friedman test was used to find out if there were differences among the various constraints affecting melon production, as such, frequencies and percentages of these various factors were not made available in Table 6. Hence, the frequencies and percentages of the same factors according to their level of seriousness were made available in Table 4.

CONCLUSION AND RECOMMENDATIONS

The study concludes as follows:

1. Melon production in the study area is constrained by several factors that are capable of reducing the farmers production output and make farmers reduce their interest in the production of the crop.
2. Farmers are likely unaware of extension service, therefore there is the potential that the farmers production output could increase if the farmers are targeted by the extension agents. Such extension services should be
3. There is a wide spread of information from farmers to farmers and this is likely because the farmers seriously lacked the services of extension agents. The farmers may therefore be relying on their indigenous knowledge in the production of melon.

Based on the findings of the study, the following recommendations were made:

1. The agricultural extension agency should target melon farmers in the study area should target melon farmers in the study area with special training programmes. This will help build the farmers capacity in melon production.
2. Melon farmers should be advised to join farmers groups such as cooperative societies; this will make them to be better positioned in seeking loan and grants from government and financial institution.

REFERENCES

- Abiola, M. O. and Daniel, I. (2014). Efficiency of melon production in Oredo Local Government Area of Edo State, Nigeria. *International Journal of Agriculture Innovation*, **2**(5): 732- 738.
- Achingan-Dako, G. E., Fagbemissi, R., Ahanchade, A. and Avohou, H. T. (2006). Agronomic evaluation of three *Egusi* species (cucurbittaceae) used as food in Benin and development of a predictive model performance. *Biotechnology, Agronomy and Social Environment*, **10**(2): 121-129.
- Adojutelegan, O. T, Adereti, F. O, Makanju, T. S. and Olorunfemi, O. D. (2015). Analysis of Factors Affecting Watermelon Production in Ekiti State, Nigeria. *Science, Technology and Arts Research Journal*, **4**(2): 324-329.



- Agba, A. O., Adinya, E. A., Agbogo, M. A., Oniah, M. A., Tiku, N., Abam, P. and Lifu, M. (2009). Response of Egusi melon (*Colocynthis citrillus* L.) to poultry manure in Obubra, Cross River State, South-South, Nigeria. *Continental Journal of Agronomy*, **3**: 13-18.
- Alakpa, S. O. and Onemolease, E. A. (2014). Factors affecting the utilization of maize storage technologies by farmers in the transitional ecological zone of Edo State, Nigeria. *Nigeria Journal of Agriculture and Forestry*, **4**(1): 24-36.
- Antholt, C. H. (1994). "Getting Ready for the Twenty – First Century: Technical Change and Institutional Modernization in Agriculture". *World Bank Technical paper 217*. Washington, D.C.
- Delta State Monthly Planner (2013). *The geography and occupational distribution of Delta State*. Retrieved 19th September 2016 from <http://www.deltastate.gov.ng>.
- Okobia, D. O. (2007). Data analysis and representation. In Egbule, J. F. and Okobia, D. O. (eds.). *Research Method in Education for Colleges and Universities*. Agbor, Kmensuo, Educational publishers, pp 13-28.
- National Population Commission NPC (2006). *National population news bulletin*. Retrieved on 5th September, 2016 from www.nigeriagallery.co/state_nigeria/delta_state.html
- Oladele, I. (2005). Farmers' perception of agricultural extension agents' characteristics as factors for enhancing adult learning in Mezam Division of Northwest Province of Cameroon. *Australian Journal of Adult Learning*, **45**(2), 223–235.
- Onyemekonwu, R. C. (2018). *Assessment of farmers Knowledge, adoption and constraints in Watermelon production in Delta State, Nigeria*. Ph.D. thesis Department of Agricultural Economics and Extension, Faculty of Agriculture, Ambrose Alli University, Ekpoma, Edo State, Nigeria. Pp 130, 135.
- Olaniyi, J. O. (2008). Growth seed yield response of *Egusi* melon to Nitrogen and Phosphorus fertilizers Application. *American-Eurasian Journal of sustainable Agriculture*, **2**(3): 255-260.
- Oriakhi, H. and Okoedo-Okojie, D. U. (2013). Arable crop farmer's preference for agricultural information sources and adoption of technology in Edo State, Nigeria. *Journal of Agriculture and Veterinary Science*, **3**(1): 31-35.
- Sadiq, M. S., Mohammed, A. and Yusuf, T. L. (2013). Economic of scale and cost efficiency in small scale *Egusi* melon production in Bida Local Government Area of Niger State, Nigeria. *Journal of Agriculture and Veterinary Science*, **2**(6): 92- 97.
- Sodiya, C. I. (2013). Contribution of Neglected and underutilized crop species (NUS) to sustainable rural livelihood in Ogun State, Nigeria. *Journal of Sustainable Development*, **10**(1): 73-81.