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ANALYSIS OF FARM LABOUR SUPPLY AMONG CUCUMBER FARMERS IN IKOT EKPENE AGRICULTURAL ZONE, AKWA IBOM STATE, NIGERIA

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Abstract

The study analyzed farm labour supply among 90 cucumber farmers that were randomly selected using a multistage sampling in Ikot Ekpene Agricultural Zone, AKS, Nigeria. Specifically, the study sought to examine the socioeconomic characteristics of cucumber farmers in the study area; examine the amount of labour utilized for different cucumber production operation; estimate the determinants of cucumber productivity and examine constraints to cucumber production in the study area. Structured questionnaire was used to collect data which were analyzed using means, frequencies, standard deviation, multiple regression analysis and the Likert Scale Rating technique. Result revealed a mean farming experience, age, household size and farm size of 5 years, 4 years, 5 persons and 0.5 hectare and 5 persons respectively. Majority (62.21) of respondent were female, married (71.1%), educated (87.3%), and participation in off farm activities (83.3%). Findings showed that while men participated more in land clearing (81.1%) and land preparation (76.6%) women were actively involved in weeding (79.2%) and harvesting (45.1%). Children on their part participated more on planting (44%) and fertilizer application/pesticide (47.4%), respectively. Results further showed that the major determinants of labour were farm size (p>.0.01), household size (p>0.05), education (p>0.05), farming experience (p>0.01) and quality of manure/fertilizer (p>0.01). Also, the major constraints to cucumber production were scarcity of seed and agro chemicals, lack of storage facilities, high perishability of product, pest and disease infestation, low prices of product, high cost of labour, poor labour supply, poor access to credit, thefts of product, and low yield, respectively. It is recommended that prices of input should be subsidized, extension agents should be deployed to the area and that effort should be made to discharge the high off farm participation among cucumber farmers in the study area.

Keywords: Labour supply; Cucumber production; productivity

Introduction

Farm labour have been widely acknowledged as a major source of employment in Akwa Ibom State, (Bassey *et al*, 2016; Bassey *et al*, 2015 and Bassey *et al*, 2014) in particular and Nigeria, in general (Agwu *et al,* 2014, Yusuf, 2018). Studies have shown that there is a sharp decline in farm labour supply in Akwa Ibom State in recent time (Bassey *et al*, 2016; Bassey *et al*, 2015 and Bassey *et al*, 2014). This has been likened to several factors such as the prevailing low wage rate and the low and fluctuating income that characterized rural farm sector (Bassey *et al*, (2020 and 2022). It is also as a result of increased rural- urban migration occasioned by the high wage rate in the non- farm sector. Consequently, rural farmers resort to hired labour which is not just costly but also add up to the overall production cost. Deotti and Estruch (2016) reported the high wage rate of hired labour in some rural villages in Nigeria. The high wage rate has compelled most farmers to use their young children as farm laborers (Okon, Udo, Nwankwo & Udo, 2019). As reported by Bassey *et al.,* (2015), labour is a limiting input in farm production in the study area and accounts for a huge chunk of total production cost. Most households with abundant labour resource can pool their labour and monthly income and channel them to productive investments (Okon, *et al*, 2016)

Cucumber is one vegetable whose production requires constant availability and supply of labour. Cucumber *(Cucumis sativus L.)* belongs to the family *Cucurbitaceae* and is cultivated as one of the major vegetable crops due to its high

nutritive value. It is considered as one of the important crops globally though it has not been ranked in tropical Africa because of its limited use (Wilcox *et al.,* 2015). Cucumber farming is an enterprise in agricultural production which provides employment opportunities, income as well improving the welfare of the farmers. The vegetable does well in soils with good water infiltration rates and moisture holding capacity. The average temperature for optimum yield is between 650F and 950F and it is mostly affected by mosaic virus and downy mildew disease (Chinatu *et al., 2017.)* and is harvested when they are about 1.25 to 2 inches in diameter and 6-8 inches in length depending on cultivars. Cucumber production requires all-round labour supply for its optimum. This has, however, been a challenge due to a continuous reduction in the size of labour force. As the young and able-bodied men migrate to urban communities in search of white-collar jobs, rural population declines. As this takes place, the remaining labour force comprises of aged people and children who donot most times possess the needed strength and vigor needed for sustainable farm operation. Since constant supply of labour is critical to increasing cucumber output and productivity, availability of cheap labour supply becomes imperative. This is necessary if the current tempo of cucumber production and supply in the country must be sustained. However, despite the widely acknowledged economic and nutritional importance of cucumber, little is known about the major source of labour for cucumber production. Accordingly, the study analyzed farm labour supply and its productivity among cucumber farmers in Ikot Ekpene Agricultural Zone, Akwa Ibom State, Nigeria.

Research methodology

The Study Area

The study was conducted in Ikot Ekpene Agricultural Zone, Ikot Ekpene is one of the Local Government in Akwa Ibom State, Nigeria. It is located in the Southern part of Nigeria and lies along Latitude 5^0 10′N and Longitude 7^0 42′E. Ikot Ekpene Agricultural Zone consist of five Local Government Areas namely; Essien Udim, Ikot Ekpene, Ikono, Ini and Obot Akara. The climatic condition of the area is tropical and has a high relative humidity throughout the year. Ikot Ekpene is characterized with a mean annual rainfall between 2000mm and 2500mm. It has a land area of about 125km^2 or 48 square miles with a total population of about 225,000. As a farming community, the town also grow crops such vegetables, cocoa yam, banana, plantain, maize, cucumber etc.

Population of the Study

The population of the study consists of all cucumber farmers in Ikot Ekpene Agricutural Zone.

Sampling Procedure and Sampling Size

A multistage sampling procedure was adopted in selecting respondents who were solely cucumber farmers. In the first stage, Ikot Ekpene Agricultural Zone was purposively selected from the existing six Agricultural Zone because it is one of the major centres for commercial cucumber production in the State. Secondly, five blocks were randomly selected from the existing eight blocks that made up the Agricultural Zone. This were, Ibiaku Ntok Okpo, Urua Akpan, Ukana Iba, Ukpom Ita, and Ikpe Ikot Nkon, respectively. In the third stage, two cells each were selected from each of the chosen blocks making a total of ten cells that was adopted for the study. In the fourth stage, nine cucumber farmers were randomly selected from each of the ten cells making a total of ninety cucumber farmers that were administered with a structured questionnaire. Selection of blocks, cells and respondents was done through balloting.

Method of Data Analysis

Data were analyzed using both descriptive and inferential statistics. Labour productivity: This was analyzed using the method of Olayide and Heady (1982). In this approach, labour productivity (Y) was defined as the ratio of the total value of cucumber output to the total cost of labour employed in cucumber production.

$$\text{labour productivity (Y)} = \frac{Total\ value\ of\ cucumber\ in\ ₦}{Total\ cost\ of\ labor\ for\ cucumber\ production}$$

Multiple linear regression analysis: This was used to estimate factors that influence labour productivity among cucumber farmers in the study area. The explicit form of the model is

stated as follows:

$Y = b_0 + b_1FAS + b_2HHS + B_3EDU + b_4AGE + b_5MOI + b_6MAS + b_7FE + b_8QOM + b_9GEN + e$

Where:

Y = Labour productivity (Y) measured as the ratio of total value of output to that of input in naira

FAS = Farm size measured in hectares

HHS = Household size (number of persons)

EDU = Educational level of cucumber farmers (years of schooling)

AGE = Age of respondents (years)

MOI = Monthly income of respondents (Naira)

MAS = Marital status of the respondent (married=1, others = 0)

FE = Farming experience (years)

e = error term

QOM = Quantity of fertilizer/manure (Naira)

GEN = Gender, (Male = 1, Female = 0)

Three functional forms of the model were estimated (linear, semi log and the double log forms) and the lead equation chosen using the value of R^2, the number of significant variables and signs of coefficients of the estimates.

Likert Scale rating Technique: This was used to examine the constraints to cucumber production in the study area. The scale was categorized as "very serious = 4", "Serious = 3", "Moderately Serious = 2" and "Not Serious = 1". The bench mark of 2.5 was obtained by summing up the weights and dividing by the total number of categorizations.

That is $\frac{4+3+2+1}{4} = \frac{10}{4} = 2.5$

Accordingly, any constraint with a mean score of 2.5 and above was taken to be a serious constraint and vice versa

Finding and discussion

Socioeconomic characteristics of Cucumbers farmers

The survey result for the socioeconomic profile of cucumber farmers in the study area are presented in Table 1 shows that majority (41.1%) of respondents were within 41 – 50 years, 36.7% were above 50 years 15.5% were within 30 – 40 years while 6.7% were less than 30 years with a mean age of 41 years. This implied that cucumber farmers were still young and active in the study area. Studies by (Okorie *et al.,* 2019; Azecz and Madukwe 2010 and Wilcox *et al.,* (2015) had previously reported that younger people dominated cucumber production in Rivers State, Nigeria. Considering gender, Table 1 showed that majority (62.2%) of respondents were female while male accounted for the remaining 37. 8%. The dominance of female farmers is because cucumber farming is not as tedious as other farming activities which make it easy for women to participate at ease. This finding is in agreement with those of Okorie *et al.,* (2019) who reported that women were more into vegetable production in Enugu State, Nigeria. In terms of marital status, the Table revealed that most (71.1%) were married, 22.2% were widows and separated, respectively. Udousung *et al.* (2018), reported that 79% of the farmers in the study area were married. This implies that marriage was highly cherished in the study area which may invariably translate to abundance family labour supply since marriage is often associated with child bearing. Regarding education, the Table showed that majority (87.3%) were educated with a mean of 10 years of educational attainment. About 53.3% attended primary school, 27.8% attended secondary school, and 5.6% attended tertiary institution while 13.3% had no formal education. The high level of educational attainment of farmers will enhance their ability to understand and evaluate innovations brought to them and if possible, adopt them than their uneducated counterparts. Wilcox *et al.,* (2015) also reported that cucumber farmers were highly educated. In terms of farming experience, majority (46.7%) had between 5 – 10 years' experience 44.4% had less than 5 years' experience while 7.8 and 1.1 % had 11 – 15 and above 15 years' experience, respectively with a mean of 5 years of experience. This implied that respondents in the study area did not have sufficient experience for cucumber farming and as such may not be well versed in cucumber production practices. Studies by (Okorie *et al.,* 2019 and Wilcox *et al.,* 2015) also reported that cucumber farmers had average farming experiences less than 6 years.

Table 1: Socioeconomic Characteristics of Cucumber Farmers

Variable	Frequency	Percentage	Mean
Age: less than 30	6	6.7	
30 – 40	14	15.3	41 years
41 – 50	37	41.1	
Above 50	33	36.7	
Total	90	100	
Gender			
Male	34	37.	
Female	56	62.2	
Total	90	100.00	
Marital status			
Married	64	71.1	
Single	20	22.2	
Widower	2	2.2	
Separated	4	4.4	
Total	90	100	
Educational level			
No formal education	12	13.3	
Primary education	48	53.3	10 years
Secondary education	25	27.8	
Tertiary education	5	5.6	
Total	**90**	**100**	
Farming experience			
Less than	40	44.4	
5 – 10	42	46.7	5 years
11 – 15	7	7.8	
Above 15	1	1.1	
Total	90	100	
Total	90	100	
Monthly Farm Income			
Less than 20, 000	60	66.7	
20,000 – 30, 000	22	24.4	16200
Above 30,000	8	8.9	
Total	**90**	**100**	
Household Size			
Less than 5	30	33. 3	
5 – 10	52	57. 8	6 persons
11 – 15	7	7.8	
Above 15	1	1.1	
Total	**90**	**100**	
Off – Farm Participation status			
Yes	75	83. 3	
No	15	16.7	
Total	**90**	**100**	

Source: Field survey (2022)

The result for farm size showed that a greater chunk (57.8%) of farmers cultivated less than 1 hectare while 31.1 and 11.1% cultivated 1 – 2 hectares and above 2 hectares, respectively. The average farm size in the study area was 0.6 hectare, implying that farmer was predominantly small-scale producers. Additionally, it was revealed that a greater part (83.3%) of cucumber

farmers participated in off-farm activities while 16.7% did not. This implied that a greater part of cucumber farmers was on part time basis. The Table further showed that most of the respondents (66.7%) earned less than ₦20, 000 per month, 24.4% earned ₦20, 000 to ₦30, 000 while 8.9% earned above ₦30,000 per month. The prevailing mean monthly farm income was less than the prevailing minimum wage in the country. This might have accounted for the high off farm participation by cucumber farmers presumably to augment farm income. Considering household size, it was observed that most cucumber farmers (57.8%) had a household size of 5 – 10 persons while 7.8 and 1.1% had a household size of 11 – 15 and above 1 person, respectively. The average household size in the study area was 6 persons. This might translate into more family labour that can be used for cucumber farming.

Labour Utilization for Different Cucumber Production Operations in the Study Area

Table 2 presents the distribution of labour based on their involvement in cucumber production in the study area. Three categories of labour (men, women and children) were utilized. Table 2 showed that men were mostly involved in land clearing (81.4%) and land preparation (76.6%) prior to planting. This was followed by women who had a participation rate of 16.4 and 22.1% for land clearing and land preparation respectively. The high involvement of men in these two production operations is because these are tedious tasks that require energy and strength which only matured men possesses. This finding is in agreement with Agwu *et al*., (2014) and Amadi, Ezeh and Okoye (2019) who reported that male gender are mostly hired for bush clearing and land preparation such as mound making and ridging. Also, planting and fertilizer application were mostly carried out by children (47.4%), followed by women. This might be because these are less tedious task that children and women can handle easily. However, women most times do not want to be deeply involved with this operation due to the low wage rate associated with it. Weeding operation was mostly undertaken by women (79.2%) presumable due to the ease of operation compared to other tedious and energy sapping tasks such as bush clearing, mounding, rigidity etc. Result further showed that women (45.1%) were mostly engaged in harvesting, followed by children (33.1%) while men accounted for 21.8%. The high involvement of women in weeding and planting was previously reported by Amadi, Ezeh and Okoye (2019) in Imo State of Nigeria.

Table 3: Labour Utilization for Different Cucumber Production Operations

Labour type / Production operation	Children %	Male %	Female %	Pooled %
Land clearing	2.51	81.11	16.4	100
Land preparation	1.3	76.6	22.1	100
Planting	44	15.4	40.6	100
Weeding	11.3	9.5	79.2	100
Fertilizer application/pesticide	47.4	12	40.6	100
Harvesting	33.1	21.8	45.1	100
Mean	23.3	36.0	40.7	100

Source: Field survey (2022)

Regression Estimates for the Determinants of Labour Productivity among Cucumber Farmers

Table 4 presents the result of multiple regression estimates for the determinants of labour productivity among cucumber Farmers. The linear model was chosen from the three functional forms that were estimated (linear, quadratic and double log). The choice of the linear model was guided by its high R^2 value, and the number of significant estimates. The R^2 value in the chosen equation was 0.663, indicating that about 66.3% of the variation in labour productivity was explained by the explanatory variables included in the model. The F statistic (17.322) was significant at 1%, implying that the combine effect of the entire explanatory variable on labour productivity was significant. This attested to the goodness of fit of the estimated model.

From the result, of the 9 explanatory variables included in the model, five were statistically significant. While education (0.018), farming experience (3.016) and quantity of manure / fertilizer (1.33E-05) was positive and significantly influences productivity at 1, 5, 1 and 1 percent levels, household size and farm size significantly reduce cucumber productivity at 1 and 5 % probability levels, respectively. From the result, a unit increase in education, farming experience, and quantity of manure will increase cucumber productivity by 0.018, 3.016 and 1.33E-05 units, respectively. Also, a unit increase in farm size and household size will reduce cucumber productivity by 4.04 E-05 and0.018 units, respectively

Table 4: Multiple Regression estimate for the determinant of labour productivity among Cucumber farmers

Variable	Linear (L)	Quadratic	Double Log
Constant	5. 426	1.633	3.106
	(3.532)***	(4.934)***	(7.728)***
Farm size	– 4.04 E – 03	–6.40 E – 04	–0.1124
	(6.342)***	(0.824)	(1.742)***
HHS	– 0.018	– 0.001	–0.103
	(–2.430)**	(4.822)***	(2.430)**
Education	0.063	–0.005	–0.103
	(2.053)**	(0.946)	(1.148)
Age	–0.029	–0.013	0.033
	(1.026)	(1.891	(0.785)
Monthly income	8.62 E – 03	3.10 E– 04	6.01E-03
	(0.864)	(1.044)	(3.323) ***
Marital status	– 0.273	–0.064	-
	(1.146)	(1.534)	
Farming experience	0.056	0.024	0.1013
	(3.100)***	(2.522)**	(4.328)***
Qty of manure /fertilizer	1.33 E – 06	0.024	– 0.003
	(3.436)**	(1.436)	(4.328)***
Gender	0.721	0.345	_
	(1.006)	(0.986)	
F cal	17.22***	6.036***	12.224***
P > F	0.000	0.000	0.00
R^2	0.663	0.494	0.508

***, ** and * signify significant of 1, 5 and 10 % respectively, L signifies the lead equation while values in bracket are the t statistics

Source: output of STATA analytical software

The negative relationship of farm size is justified in that large farm size will entail the use of more sophisticated productivity enhancing equipment like tractor which may invariably results in displacement of labour. In addition, large farm size will translate into higher cost of labour which will further impact negatively on cucumber profitability. This finding support those of Obike *et al.,* (2017). The plausible explanation for the negative relationship of household size might be that the available household size in the study area are not used for cucumber production. This is evidenced by the high level of off farm work participation by respondents in the study area. Oluyole *et al.*, (2013) had also reported similar findings in their researches.

The positive and significant relationship of education is expected because education will facilitate the adoption of labour productivity

enhancing innovations. As reported by Patrick, Bassey and Uduak (2014), educated farmers are usually so well informed and accessed production information from extension agents and other sources easily them their illiterate counterparts. This finding supports those of Obike *et al.,* (2016). The justification for the positive influence of farming experiences is that experience is synonymous with efficiency and perfection. Hence, experience farmer might have been over time acquainted with labour productivity enhancing strategies and leverage on them to boost their productivity. Studies by Obike *et al.,* (2016) had also reported a posture relationship between farming experience and labour productivity. Also, the positive and significant relationship of quantity of manure / fertilizer was expected because both are linked to output growth.

Constraints faced by Cucumber farmers

Table 4, Present the constraints militating against cucumber production in the study area. From the Table, scarcity of planting material and agro chemicals ranked 1st with a mean score of 3.56, followed by lack of storage facilities that was ranked 2nd with a mean of 3.48. High yielding cucumber seeds were scarce in the study area, resulting in the use of local planting material which was low yielding. There was also inadequate storage facilities in the study area resulting in severe post- harvest loses. This called for concern due to the high perishability of the product. Wilcox (2015) and Onuwa *et al*., (2021) had reported separately that lack of seeds was a major constraint in cucumber production. Also, lack of storage facilities was also reported by Wilcox (2015) as a major constraint.

High perishability of product was ranked 3rd (mean=3.24), pest and disease infestation 4th (mean=3.17) and low prices of product 5th with a mean score of 3.16. Like other vegetables, cucumber is highly perishable and must be disposed of immediately after harvest except adequate preparation is made for its storage. However, in the study area, storage facilities were lacking resulting in numerous farmers disposing their products cheaply at farm gate prices. Incessant cases of pest and disease infestation were reported in the study area. This was a serious challenge as some respondents appeared to lack adequate pest control knowledge. Incidence of pest attack and disease infestation was previously reported by Onuwa *et al.,* (2021), Etim *et al.,* (2016) and Wilcox (2015) in their studies respectively. In addition, farmers reported that their products were most times underpriced. This situation arose because of lack of storage facilities which resulted in farmers disposing their products to avoid spoilage, considering the perishable nature of the product. High cost of labour was ranked 6th, poor access to extension services 7th, poor access to credit 8th, theft of product 9th, low yield 10th and land scarcity 11th with mean scores of 3.07, 3.0, 2.90, 2.81, 2.51 and 1.93, respectively. Cases of labour scarcity was reported in the study area and resulted in high labour cost. Studies by Wilcox (2015) and Onuwa *et al.,* (2016), reported that high labour cost were major constraints to cucumber production. Also, access to extension was poor in the study area. This resulted in low use of modern cucumber, production inputs and might have accounted for the high scarcity of high yielding planting material in the area. Lack of extension contact was previously reported as a constraint by Onuwa *et al.,* (2021) and Etim *et al*., (2016). Cases of cucumber theft were reported to be rampant in the study area. These were most times perpetuated by labourer engages to work in the cucumber farms

Additionally, most of the cucumber growers in the area were low yielding varieties. Because of lack of improved planting material, farmers resorted to the use of local species that are not only low yielding but also late maturing. Land scarcity was not a major constraint in cucumber production in the study area.

Table 5: Constraints faced by Cucumber Farmers in the Study Area

Constraints	VS	S	MS	NS	Total	Mean	Rank
lack of storage facilities	50	34	5	1	313	3.48	2rd
Pest and disease infestation	33	43	10	4	285	3.17	4th
Low prices of product	40	26	22	2	284	3.15	5th
High perishability of product	31	50	9	0	292	3.24	3rd
High cost of labour	25	46	15	4	272	3.02	6t
Poor access to Extension services	37	23	23	7	270	3.0	7th
Theft of products	26	35	15	14	253	2.81	9th
low yield	18	30	22	20	226	2.51	10th
Scarcity of seed and agro chemical	60	20	10	0	320	3.56	1ST
Lack of land	10	17	20	43	174	1.93	11th
Poor access to credit/ low capital	40	20	16	10	262	2.91	8th

Note: VS, S, MS, NS, represents "very serious" "serious" "moderately serious" and "not serious" respectively.
Source: computed from field survey data 2022.

Conclusion

In this study, labour supply in cucumber production have been analyzed. Findings have shown that a greater part of labour utilized for cucumber production were women. Majority of cucumber farmers were seriously engaged in one off farm activity and the other. Hence, the study concluded that future research efforts and policy that is directed towards enhancing cucumber productivity should be directed towards reducing off farm participation among cucumber producers

Recommendations

i. Prices of fertilizer, planting materials and other cucumber production inputs should be subsidized. If possible, fertilizer production plants can be built and farmer should be taught how to prepare compost manure.

ii. Cucumber farmers should be encouraged to enroll in evening schools and satellite colleges so as to broaden their knowledge. The role of extension agents becomes indispensable as they will disseminate modern cucumber production techniques as well as pests and diseases control measures to farmers.

iii. Effort should be made to reduce the high off farm participation among cucumber farmers. This can be achieved by carrying out series of awareness campaigns on the benefit and lucrative returns associated with cucumber farming.

iv. Cucumber farmers should be encouraged to go into processing as a way of minimizing poor harvest loses, if possible, low-cost processing plants can be built in the study area.

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