



## **ROLE OF TREE CROPS CULTIVATION ON INCOME GENERATION: FOCUS ON EMPLOYMENT CREATION, IN ISOKO NORTH LOCAL GOVERNMENT AREA OF DELTA STATE, NIGERIA**

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### **ABSTRACT**

The study assessed the contributions of tree crops to income of rural households in Isoko North of Delta State, Nigeria. A multi-stage sampling procedure was adopted in composing a sample. Data were collected through the use of a structured questionnaire from 288 respondents for this study. The results obtained indicated that oil palm was the most commonly cultivated tree crop in the area (81.25%). Other tree crops grown in the area were; Papaya (69%), coconut (66.67%), rubber (36.11%) among others. The results also showed that tree crops contributed insignificantly to household income. In fact, only about 4.52% of the respondents earn more than 20% of their income from tree crops. Regression result showed that 55% variation in household income from tree crops could be explained by the explanatory variables included in the model while the other 45% was as a result of other factors not specified in the model. The coefficient of sex, education and household size were significant ( $P \leq 0.01$ ). It was concluded that tree crops contributed little to the households' income, and it was recommended, among others that concerted efforts should be made by all stakeholders to encourage the large scale production of tree crops, farmers should be encouraged to diversify their sources of income by growing not only food crops, but tree crops. Seminars, workshops and lectures should be organized in order to sensitize the respondents on the importance of growing tree crops.

**Keywords:** Creation, Employment, Generation, Income and Tree

### **INTRODUCTION**

Tree crops planting have been of great benefits; it provides a range of restoration system to degraded environments and lands with positive effects on food production, ecosystem health and job creation (Muhammad *et al.*, 2022). In Nigeria, tree crops play a significant role in rural livelihoods. Not only as a source of income but as a source of foreign exchange earnings and employment creation (Ureigho and Bomi-Dore, 2018). It can as well help reverse forests loss and degradation on rural communities in the tropics by providing secure access for local people to a range of forest products, it is clear that tree planting is necessary. Tree crops cultivation also contribute to improving livelihood outcomes among farming household by providing additional income for seasonal gap filling. Evidences has shown that tree crops tend to provide a buffer during times of poor annual crop harvests caused by unfavorable climatic conditions. These crops are the second largest foreign exchange earner after crude oil and the most important agricultural export crop. In the first half of 2019, tree crops such as cocoa and cashew contributed about 90 billion naira equivalent to (230 million US Dollars) (Enwa and Ewuzie, 2023). Studies has proven that (Iarinde and Santus 2014; Adepoju, 2015, Olugbire, 2020) the south- south Nigeria is blessed with a fertile land for tree crop planting.

Isoko North Local government area is one of the most endowed LGA in Delta State in terms of good agricultural land and other natural resources like crude oil. In the agricultural sector, informed assessment indicates that the area supports the cultivation of many crops,



especially tree crops like oil palm, rubber and citrus. The rich deltaic deposits had made the soil favourable for the growth of tree crops. This array of crops is not all inclusive and does not however, include the numerous edible wild forest fruit trees and vegetables that are yet to be cultivated and commercialized in the area. (Ureigho and Bomi-Dore, 2018). According to Miller *et al.* (2016), the biological convention that qualifies a plant as a tree is that the plant must be a woody perennial with a trunk or elongated stem that supports branches and leaves. They further asserted that with the help of several experts crop plants have divided into five subcategories: (1) fruit trees (e.g. coconut, lemon, etc.); (2) tree cash crops (e.g. cocoa, rubber, etc.); (3) timber and fuelwood trees (e.g. Obeche, Iroko, bamboo, etc.); (4) plant/herb/grass/roots (e.g. maize, banana, etc.); and (5) unidentified (e.g. voandzou, wechino, etc.). With this classification it is obvious that the first three category constitute tree crop which the study focused on.

The Sub-Saharan part of Africa is a home to many local fruit trees, where they play crucial roles in livelihood of many rural dwellers (Muhammad *et al.*, 2022). These trees can be very important source of food supplement diet, and could be one of the main options for coping with hunger, nutrient deficiency, alleviation and generating income necessary for increasing the purchasing power of rural people. Trees are often a vital component of agriculture-forest landscapes. They play crucial ecological functions such as provision of soil nutrients, habitat for animals, and greater structural connectivity (Oroka and Ureigho, 2019 and serve as a key basis for biodiversity conservation (Schroth *et al.*, 2013) and climate change adaptation and mitigation (Mbow *et al.*, 2014). Moreover, sub-national case studies further suggest that on-farm trees often also play an important role in rural livelihoods, whether directly as a source of income (from timber or non-timber products such as fruit) (Olugbire, 2020; Kalaba *et al.*, 2010; Mbow *et al.*, 2014b), or indirectly for the ecological roles they play like nitrogen fixing, control of soil erosion, or provision of shade (Place and Garrity, 2015). Approximately about a third of the agricultural land in Sub-Saharan Africa is estimated to possess at least 10% tree cover during 2008-2010 (Zomer *et al.*, 2014). Trees and agricultural activities therefore often co-exist not only in larger landscape contexts but also in single landowner holdings.

In spite of many studies carried out on the importance of trees to rural livelihood and on others aspects of rural life, there is dearth of studies conducted on the contribution of tree crops to rural household income. This is so because trees on farms (such as mango, oil palm, coconut) are often neglected in research and policy formulation. Most focus is on trees in forests rather than other economic trees (Barton, 2002; Oroka and Ureigho 2019). Most studies on agriculture and livelihood studies are usually on annual crops and their effects on household income. When perennials crops (such as oil palm, cocoa, rubber and mango) are studied, it is mostly from different perspectives. Consequently, economic trees other than forest trees are often left out in agricultural and livelihood studies and knowledge about their prevalence and economic contribution to household income remains low. Delta State in general and Isoko North in particular, studies on the contribution of tree crops to income of rural households limited. However, the broad objective of the study is to determine the contribution of tree crops to rural household income and employment creation in Isoko North LGA of Delta State. The specific objectives were to:

- i. describe the socio-economic variables of the respondents;
- ii. identify the type of tree crops grown in the area;
- iii. assess the proportion of respondents that grow tree crops;
- iv. ascertain the income earn from tree crops; and
- v. determine the influence of socio-economic variables on household income from tree crops.



**METHODOLOGY**

**The Study Area**

The study was conducted in Isoko North Local government area of Delta State, Nigeria. Isoko North is one of the twenty-five local government areas in Delta State. The location of Isoko North LGA is 5.00°E and 6.00°E and 7.09° and 8.00°S. The estimated population is 144,155 (National Population Commission, 2022). Isoko North Local Government Area shares boundaries with to the South West, Isoko South Local Government Area to the South to the West by Ughelli North Local Government Area, to the North by Ndokwa West Local Government Area and to the East by Ndokwa East Local Government Area, all in Delta State. The LGA comprises of 13 clans: Ozoro, Ellu, Okpe-Isoko, Iyede, Ofagbe, Aradhe, Owhelogbo, Emevor, Otor- owhe, Bethel, Ovrode, Oyede and Otor-Iyede. The Area is low-lying with no noticeable hills or mountains and a fertile land suitable for agriculture. The annual rainfall is over 2000mm per annum and temperature range is between 28<sup>0</sup>c – 34<sup>0</sup>c. The relative humidity is very high, over 80%. There are two main season – the dry season (November- March) and rainy season (April-October). Major crops grown include oil palm, cassava, rubber, pineapple, cocoyam, yam, citrus, pepper, plantain/banana, coconut, potato, groundnut and cocoa.

**Sampling Procedures**

A multi-stage sampling procedure was employed to select sample used for the study. Five out of 13 clans in Isoko North local Government Area were randomly selected using the ballot system. In the second stage, four communities were also randomly selected from each of the five clans selected. In the third and final stage, 5 percent of the rural households were selected from each of the communities. A total of 288 respondents were selected and used for the study.

**Method of Data Collection**

Semi- structured interview, and self-designed household questionnaire were used. In addition, triangulations were employed to obtain different opinions about participant’s view on the sources of income from various activities of the farming households. Household heads were purposively interviewed. In addition, physical observation was also done in order to have a clue on the socio-economic impact of indigenous fruit trees in the study area. All the households sampled were involved in indigenous fruits collection and sales. The interviews and questionnaire captured data on socio-economic characteristics of the household heads, the possession tree crops, types of tree crops owned, income from the tree crops, total household income and other variables of interest.

**Method of Data Analysis**

The data obtained from all the sources were analysed using descriptive statistics (frequency, percentage and mean) and inferential statistics (multiple linear regression) using SPSS version 25.0. The Multiple linear regression Model Specification. The model is specified as shown in Equation 1:

$$Y = a + b_1x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + b_6 x_6 + b_7 x_7 + e \quad \dots(1)$$

Where:

Y = Amount earned from tree crops by household measured in naira

x<sub>1</sub> = Age (measured in years);

x<sub>2</sub> = Sex (Male=1, 0-Female)

x<sub>3</sub> = Marital status (dummy, having spouse = 1; 0, otherwise);

x<sub>4</sub> = Education (number of years spent in schooling);

x<sub>5</sub> = Farming experience (numbers of years spent as a farmer)

x<sub>6</sub> = Household size (number of individuals in a household);

x<sub>7</sub> = Extension visit (number of extension visit per year)



**RESULTS AND DISCUSSION**

**Socio-economic characteristics of rural household heads**

Table 1 presents the socio- economic characteristics of respondents in this study. The Table reveals the socio-economic characteristics of the sampled household heads. The results showed that about 62.85 per cent of the household heads were between 21 and 60 years of age with mean age of 46 years. This is a clear indication that most of the respondents were in the economically active age group and can engage in to tree crop planting. The sex distribution of the respondents indicates that 52.78% were males while 47.22% were females, implying that, there are more males involve in tree crop planting than female’s household heads. The respondents had 17 years as mean year of farming experience. About 80.90% of the respondents lived with their spouses (married) with mean household size of 5 persons. Majority of the respondents had one form of formal education or the other; only about 6.25% of the respondents had no formal schooling. This is an indication of high literacy level among household heads in the study area. The result of the study is similar to the research work carried out by Ohaga (2019) where the respondents in his study had a high literacy level. The result also showed that the extension visit or contact was very poor as 88.19% never had any visit from extension agents.

**Table 1: Distribution of the socioeconomic characteristics of household heads**

<b>Socio-economic Variables</b>	<b>Frequency (n=288)</b>	<b>Percentage (100%)</b>
<b>Age</b>		
< 21 years	38	13.19
21 – 40 years	78	27.09
41 – 60 years	103	35.76
>60 years	69	23.96
<b>Mean</b>	46 years	
<b>Sex</b>		
Female	136	47.22
Male	152	52.78
<b>Marital status</b>		
Married	233	80.90
Single	55	19.10
<b>Educational attainment</b>		
No formal	18	6.25
Primary	19	6.60
Secondary	177	61.46
Post- Secondary	74	25.69
<b>Farming experience</b>		
10 years and below	42	14.58
11 – 20 years	118	40.97
Above 20 years	128	44.45
<b>Mean</b>	17 years	
<b>Household size (number)</b>		
1-5	45	15.63
6-10	229	79.51
11-15	14	4.86
<b>Mean</b>	5 persons per household	
<b>Extension visit</b>		
No visit	254	88.19
Visit	34	11.81

Source: Field survey (2023)



**Tree crops grown in the area**

The prominent tree crops found in the area were presented in Table 2. The result indicated that the oil palm was the most commonly owned tree crop in the area. About 81.25% of the respondents own oil palm trees. However, most of the oil palm owned by the respondents were of the wild groove. Other tree crops grown in the area were: Papaya (69%), Coconut (66.67%), rubber (36.11%), Cocoa (35.41%), Raphia palm (30.56%), Citrus of different types (29.17%) and others as shown. Forest trees included species like Obeche, Mahogany, Iroko and Afara trees, exploited mainly for timber and plywood. This study is in agreement with the study conducted by Vernooy (2022). In his study, the result showed that oil palm was the most and commonly owned by rural farmers.

**Table 2: Major tree crops grown in the area by respondents**

<b>Tree crop</b>	<b>Frequency (n=288)</b>	<b>Percentage*</b>
Oil palm	234	81.25
Pawpaw (Papaya)	201	69.79
Coconut	192	66.67
Rubber	104	36.11
Cocoa	102	35.41
Raphia palm	88	30.56
Citrus	84	29.17
Cashew	29	10.07
Mango	89	30.90
Avocado pear	69	23.96
Bush mango	34	11.81
Guava	77	26.74
Kola tree	71	24.65
Forest trees (all species)	24	8.33

**Source:** Field Survey (2023) \* Multiple responses.

**Result of the income earned from tree crops**

Table 3 classifies the respondents according to the range of income earned from tree crops. Although tree crops were owned by most of the farmers, the result in Table 3 however, indicated that majority (74.65%) of the respondents earn less than ₦ 21,000 from tree crops. About 4.16% of the respondents earn between ₦21,000 - ₦40,000. However, only 4.86% earned between ₦41,000- ₦ 60,000. Similarly, 10.76% and 5.56% of the respondents earned annual income between ₦ 61,000 - ₦ 80,000 and between ₦ 81,000 - ₦ 100,000 respectively. The implication this finding is that the farmers earn very little from tree crops.

**Table 3: Annual income earned from tree crops by respondents**

<b>Annual income (naira)</b>	<b>Frequency (288)</b>	<b>Percentage (100)</b>
Less than 21,000	215	74.65
21,000 – 40,000	12	4.16
41,000 – 60,000	14	4.86
61,000 – 80,000	31	10.76
81,000 – 100,000	16	5.56

**Source:** Field Survey (2023)



**Result of the contribution of tree crops to total household income**

The contribution of tree crop to total household income is presented in Table 4. From the result presented, it was obvious that as much as 77.78% asserted that tree crops contributed less than 6% of their total annual income. The result also indicated that for majority of the respondents, tree crops contributed insignificantly to household income. In fact, only about 4.52% of the respondents earn more than 20% of their income from tree crops. This finding corroborated with Miller *et al.* (2016) who observed that the income share of tree crops in total household income on the average was 7% in Nigeria, Tanzania and Uganda and 3% in Malawi. However, this is in contrast to the result obtained in Namibia by Elago and Tjaveondja (2015) who observed that tree crops contributed about 51.6% of total household income.

**Table 4: Contribution of tree crops to total annual household income**

Contribution of income (percentage)	Frequency (n=288)	Percentage (100)
Less than 6	224	77.78
6 – 10	24	8.33
11 – 15	19	6.60
16 – 20	8	2.78
21 – 25	8	2.78
26 – 30	5	1.74

**Source:** Field Survey (2023)

**Influence of socio-economic variables on household income from tree crops**

Table 5 shows the socio-economic factors determining farmers’ income from tree crops. Regression result showed that 55% variation in household income from tree crops could be explained by the explanatory variables included in the model while the other 45% was as a result of other factors not specified in the model. The F- value is 7.98 and statistically significant at  $P \leq 0.5$ , meaning that the model was fitted in explaining the variation of household income of respondents from tree crops production. The coefficient of sex, education and household size were positive and significant at  $P \leq 0.05$ ,  $P \leq 0.001$  and  $P \leq 0.01$  respectively. Educated farmers are known to possess more skill and knowledge to know the value of tree crops, adopt new technologies and adapt to changing environment. Also, farmers who have larger household sizes are known to diversify their sources of income so that they can cater for their large family members. Sex was significant, indicating that males and females were more likely to obtain more income from tree crops production in the study area. It is concluded that tree crop production is an alternative source of household income in the study area.

**Table 5: Influence of socio-economic variables on household income from tree crops**

Variable	coefficient	Standard error	T value	P value
Constant	12.23	189.43	0.0646	0.87
Age	1.99	5.79	0.3437	0.18
Sex	12.67	6.44	1.9674	0.05*
Marital status	1.78	4.01	0.4439	0.45
Education	25.45	7.04	3.6151	0.001***
Farming experience	2.41	3.56	0.6770	0.69
Household size	19.07	8.40	2.2702	0.01**
Extension contact	0.98	0.77	1.2727	0.82
<b>R<sup>2</sup></b>	<b>0.55</b>			
<b>Adjusted R<sup>2</sup></b>	<b>0.48</b>			
<b>F – value</b>	<b>7.98*</b>			

**Source:** Field Survey, (2023)



## CONCLUSION AND RECOMMENDATIONS

The study revealed that tree crops contributed to the households' income. However, sex, education and household size were positive and significantly influence household income generated from tree production. Although most of the respondents grow one form of tree crop or the other. The following recommendations thus emanate from the study:

- i. Since majority of the respondents obtain less than 7% of their income earnings from tree crops, concerted efforts should be made by all stakeholders to encourage the large scale production of tree crops. Moreover, farmers should be encouraged to diversify their sources of income by growing not only food crops, but tree crops as well
- ii. Seminars, workshops and lecture should be organized in order to sensitize the respondents on the importance of growing tree crops

## REFERENCES

- Adepoju, A. (2015). Investment Opportunities for Tree Crops Development, Processing and Marketing in Nigeria. *Journal of Poverty Investment Development*, **7**(1):23-29.
- Barton, G. A. (2002). **Empire Forestry and the Origins of Environmentalism**. Cambridge University Press, Cambridge.
- Elago, S. N. and Tjaveondja, L. T. (2015). Socio-Economic Importance of Two Indigenous Fruit Trees: *Strychnos Cocculoides* and *Schinziophyton Rautanenii* to the People of Rundu Rural West Constituency in Namibia. *European Journal of Physical and Agricultural Sciences*, **3**(2):16 – 27.
- Enwa, S. and Ewuzie, P. (2023). Effects of Covid-19 pandemic on commodity price Volatility and the welfare of farming household in Nigeria. *Journal of Biodiversity and Environmental sciences*, **22**(3):1-8.
- Kalaba, K. F., Chirwa, P., Syampungani, S. and Ajayi, C. O. (2010). Contribution of agroforestry to biodiversity and livelihoods improvement in rural communities of Southern African regions, in: Tsharntke, T., Leuschner, C., Veldkamp, E., Faust, H., Guhardja, E., Bidin, A. (Eds.), *Tropical Rainforests and Agroforests Under Global Change: Ecological and Socio-economic Valuations*. Springer, Berlin, pp. 461-476.
- Larinde, S. L. and Santus, R. (2014). Assessment of Small Scale Private Plant Nursery in Port Harcourt, Rivers State. *Global Journal of Bio-science and Bio-Technology*, **3**(3):301-311.
- Mbow, C., Smith, P., Skole, D., Duguma, L. and Bustamante, M. (2014a). Achieving mitigation and adaptation to climate change through sustainable agroforestry practices in Africa. *Current Opinion in Environmental Sustainability* **6**, 8-14.
- Mbow, C., Van Noordwijk, M., Luedeling, E., Neufeldt, H., Minang, P. A. and Kowero, G. (2014b). Agroforestry solutions to address food security and climate change challenges in Africa. *Current Opinion in Environmental Sustainability* **6**, 61-67.
- Miller, D. C., Muñoz-Mora, J. C. and Christiaensen, L. (2016). Prevalence, Economic Contribution, and Determinants of Trees on Farms across Sub-Saharan Africa. World Bank Group, African Region of the Chief Economist. Policy Research Working Paper 7802.
- Muhammad, A. M., Alhassan, Y. J., Aladare, S. J., Sabo, A.Y., Chari, A. and Yusuf, A. B. (2022). Analysis of Costs and Returns from Tree Crops Planting in Tropical Environment. *South Asian Journal of Agriculture and Fisheries*, **4**(5):67-78.
- Oroka, F. O. and Ureigho, U. N. (2019). Effect of organic manures on the early seedling morphology of *irvingiawombolu* (*Vrmoesen*) in the tropical rainforest Nigeria, *Ceylon Journal of Sciences*, **48**(2):163-168.



- Olugbire, O. O. (2020). Market Opportunities and Profitability of Tree Crops Planting in Nigeria. *Journal of Applied Sciences and Environmental Management*, **24**(11):121-133.
- Ohaga, J. B. (2019). *Social Entrepreneurs: Invest in Trees*. One Acre Fund 2019 Annual Report.
- Place, F. and Garrity, D. (2015). *Tree-based Systems in Africa's Drylands*. World Bank Group, Washington, DC.
- Schroth, G., da Fonseca, G. A., Harvey, C. A., Gascon, C., Vasconcelos, H. L. and Izac, A. M. N. (2013). **Agroforestry and biodiversity conservation in tropical landscapes**. Island Press, Washington, DC.115Pp.
- Ureigho, U. N. and Bomi-Dore, O. (2018). Growth and Yield Prediction of Treak (*Teconagrandis*) in Iyiocha Stream Forest Reserve, Edo State, Nigeria. *International Journal of Agriculture and Rural Development*, **22**(2):445-455., <https://www.ijard.com/journal>,
- Zomer, R. J., Trabucco, A., Coe, R., Place, F., Van Noordwijk, M. and Xu, J. C. (2014). *Trees on farms: an update and reanalysis of agroforestry's global extent and socio-ecological characteristics*. ICRAF, Bogor, Indonesia.