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**Production of African Walnut (*Plukenetia conophorum*) and the
Contribution to Rural Livelihood in Ekiti State, Nigeria****Dr. O.J. Olujobi**

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Plant materials such as root, stem, leaf, fruit and seed provide food, medicine and other products of economic importance to mankind. This study examines the production of African walnut and its contribution to rural livelihood in Ekiti State. The study area was stratified on the basis of geopolitical arrangement into three (3) senatorial zones. Two villages were selected from each senatorial zone. Structured questionnaire were administered to twenty (20) randomly selected farmers in each of the six selected villages. Field observations revealed that majority of the respondents are married (81.7 %), male (61.7 %), and above 51 years (41.67 %) with 76.67 % of them having more than 10 years of farming experience. Majority of the respondents (85.04 %) acquired their land through inheritance while only 23.33 % produce more than 100kg of walnut per year with most of it been sold in bit. The result also revealed that in addition to providing income walnut also serves as source of food, medicine and cultural value among the respondents. Lack of storage facility, drought and theft were the major challenges faced by the respondents in the production of walnut in the study area. The study recommend that government through extension officers should enlightened farmers on how to embarking on large scale cultivation of the crop in other to increase their production.

Keywords: *Plukenetia conophorum*, production, contribution, rural livelihood, Ekiti State.

INTRODUCTION

African walnut (*Plukenetia conophorum*) is a tropical climbing shrub native to western and central Africa. It is grown in abundance and widely consumed by the inhabitants of Africa majorly Nigeria, Cameroon, Republic of Congo and Democratic Republic of Congo. *Plukenetia conophorum* (formerly called *Tetracarpidium conophorum*) belongs to the botanical family Euphorbiaceae (sub family: Acalyphiodeae) in the order Malpighiales of Angiosperms in the plant kingdom (Keay, 1989). It is commonly referred to as African walnut because of its origin to the West Africa rainforest. In Nigeria, it is called 'Awusa or Asala' by the Yorubas, 'Ukpa' (Igbo), Gawudibairi (Hausa) and Ekporo (Efik and Ibibio of Cross River) and in Western Cameroon, it is known as 'Ngak or Kaso (Akpuaka and Nwankwo, 2000; Ojobor *et al.*, 2015).

African walnut is one of the indigenous plants that have a long history as a food plant mostly found in the wild and recently cultivated by peasant farmers for its nuts. The plant is grown in abundance for its nut and widely consumed by Africans majorly in Nigeria, Cameroon, Republic of Congo and Democratic Republic of Congo (Ojobor *et al.*, 2015). When cooked the nuts are consumed by many as snacks; they can be cooked, roasted or sun dried, the roasted seeds can be grounded like melon seeds used as thickener in soup preparation. Dried walnuts can be grounded and turned into flour which can be used as composite flour during baking or as a substitute for milk (Ekwe and Ihemeje, 2013). Also, the oil from the nut is fast drying and has been used in the formulation of wood varnish, stand oil, vulcanized oil for rubber and leather substitute (Awodoyin *et al.*, 2000).

The importance of African walnut as an indigenous fruit climber is enormous as it is a multipurpose crop which has been proven to have decorative, medicinal, industrial and agricultural values over the years (Kanu *et al.*, 2015). When eaten boiled, it has a bitter taste usually observed upon drinking water which is attributed to the presence of alkaloids (Edem *et al.*, 2009). The nuts, leaf, root and stem bark are used in tradition medicine for treatment of many ailments (Ojobor *et al.*, 2015). The nuts are believed to detoxify kidney, strengthen the back and knees and moisten the intestines (Ayoola *et al.*, 2011). The leaf of *P. conophorum* is used for the treatment of dysentery and also to improve fertility in males. The bark is used in tea as laxative, chewed for toothache, prevent and control high blood pressure (Ajaiyeoba and Fadare, 2006). The root is used for treatment of haemorrhoids and varicose ulcers (Samson *et al.*, 2014).

Local populations within the West and Central African region exploit the seeds to generate incomes to enhance their social and economic need. Despite the huge socio-economic potentials of this species, information on yield studies and its contribution to the economy of rural dwellers are inadequate. Therefore, this study was carried out to investigate the level of production of African walnut (*Plukentia conophorum*) and the contribution of the crop to the livelihood of rural dwellers in Ekiti state.

METHODOLOGY

Study area

The study was carried out in Ekiti state, Southwest Nigeria. The state covers about 7,500km² of land mass located between Longitude 4° 5' and 5° 45' east and Latitudes 7° 15' and 8° 5' north of the equator. The state enjoys a tropical climate with two distinct seasons; wet season between the months of April to October and dry season between the months of November to March). Temperature ranges between 21°C and 25°C, with little variation throughout the year. Annual average humidity is about 90 % at 7.00 am and 65 % at 4.00 pm. The mean annual rainfall in the southern part of the state is about 1,700 mm and in the northern part is hardly over 1,500 mm (Adebayo, 1993). The state is mainly an upland zone located on altitude of 250 m above the sea level. The topography is hilly with large number of hills of various sizes. The vegetation consists of Savannah woodland to the northern peripheries, while the southern part is predominately high forest ecosystem.

Sampling technique

The study area was stratified on the basis of geopolitical arrangement into three (3) senatorial zones. Two villages were selected from each senatorial zone. Questionnaires were administered to ten (20) random selected farmers in each of the selected villages (Table 1). The farmers were interviewed personally on the field by the researcher using the interview schedule. Data collected from the study were analysed using descriptive statistics of frequency tables and percentages.

Table 1: Distribution of respondents in the study area

Political Zones	Villages	No of Respondents
Ekiti Central	Efon-alaaye	20
	Igbaye-Ekiti	20
Ekiti North	Aaye-Ekiti	20
	Otun-Ekiti	20
Ekiti South	Omuo-Ekiti	20
	Igbara-odo	20
Total 3	6	120

RESULTS

Socio-economic characteristics of respondents

Table 2 shows that majority of the respondents are married (81.7%), men (61.7 %) with 33.33 % of them within the age range (31-50) years. The result shows that 71.66 % of the respondents had below secondary education, while 85 % of the respondents have a family of 4 - 6 members.

Table 2: Socio-economic characteristics of respondents

Variables	Frequency	Percentage (%)
Sex		
Male	74	61.67
Female	46	38.33
Age		
≤ 30 years	30	25.00
31-50 years	40	33.33
51-70 years	32	26.67
≥ 70 years	18	15.00
Marital status		
Single	4	3.33
Married	94	81.67
Divorced	4	3.33
Widowed	14	11.67
Educational background		
No formal education	34	28.33
Primary education	52	43.33
Secondary education	32	26.67

Tertiary education	2	1.67
Household size		
1-3	4	3.33
4-6	102	85.00
≥ 7	14	11.67
Total	120	100

Respondents farming practices

Table 3 shows that 51.67 % of the respondents have over 11-20 years of farming experience with majority of the respondents (80 %) being full-time farmers. Also 46.66 % of the respondents operate on farm land of < 5 hectares, while 85.83 % of the respondents depend on family members for their source of labour. The result also shows that 85.04 % of the respondents acquired their farm land through inheritance.

Table 3: Respondents farming practices

Variables	Frequency	Percentage (%)
Year of experience		
1-10 years	28	23.33
11-20 years	62	51.67
> 20 years	30	25.00
Farming status		
Full-Time	96	80.00
Part- time	24	20.00
Farm size		
< 5 hectares	56	46.67
5-10 hectares	32	26.67
11-15 hectares	14	11.67
> 15 hectares	18	15.00
Source of labour		
Hired	05	4.17
Family	103	85.83
Both	12	10.00
Total	120	100
Land ownership		
Inheritance	108	85.04
Lease	10	7.87
Purchase	6	4.72
Gift	3	2.36
Total	127*	100

*Multiple responses

Production and marketing of walnut

Table 4 shows the density of African walnut trees stand on the respondents' farm land. The result shows that 25 % of the respondents have 20 or more stands of walnut on their farm with 36.67 % of them harvesting between 51kg to 100kg of walnut per year. The result also shows that majority of the respondents (92.50 %) sells their product either raw or cooked with 86.67 % of them selling their product in bits.

Table 4: African walnut production and marketing

Variables	Frequency	Percentage (%)
Stand density		
< 10	38	31.67
10-19	52	43.33
≥ 20	30	25.00
Quantity harvested / year		
< 30kg	20	16.67
30kg – 50kg	28	23.33
51kg – 100kg	44	36.67
> 100kg	28	23.33
Marketing channel		
Retail	104	86.67
Wholesale	10	8.33
Both	06	5.00
Mode of selling		
Raw	07	5.83
Cooked	02	1.67
Both	111	92.50
Total	120	100

Uses of Africa walnut

Result in Figure 1 shows that the use of walnut as food material by the respondents accounted for 29.06 %; this was followed by source of income (27.60 %) and medicinal purpose (22.28 %) respectively. The result also shows that the use of walnut for cultural value by the respondents accounted for 21.06 %.

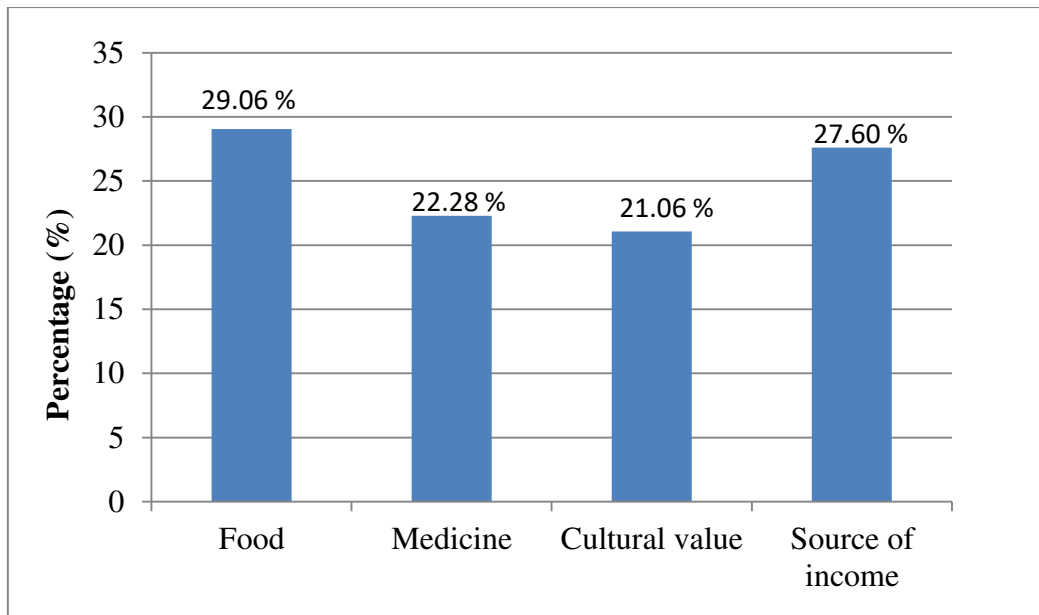


Figure 1: Uses of walnut

Production problems of African walnut

Figure 2 present problems confronted by the farmers in the production of Africa walnut. The result shows that lack of storage facilities accounted for 41.09 % of the problems faced by the farmers; this was followed by theft (21.78 %) and high cost of transportation (13.86) respectively.

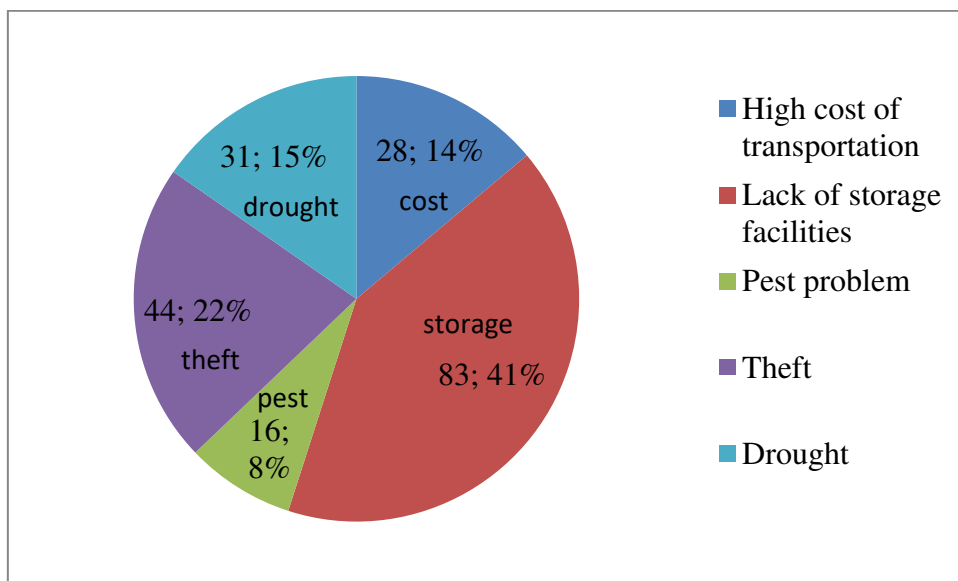


Figure 2: Respondents' production problem

Table 5 shows that 71.67 % of the respondents spent less than ₦5,000 on labour while about 60 % generate over ₦20,000 on sales of African walnut.

Table 5: Economic contribution of Africa walnut

Variables (₦,000)	Frequency	Percentage %
Cost of Labour		
< 5	86	71.67
5-10	22	18.33
11-20	8	6.67
> 20	4	3.33
Amount generated on sales		
< 10	16	13.33
10-20	32	26.67
21-30	52	43.33
>30	20	16.67
Total	120	100

DISCUSSION

Result from this study indicates that production of African walnut in the study area is mostly dominated by married men (Table 2). The involvement of married men in walnut production in this study could be due to fact that culturally they are the one that are mostly engaged in farming activities in the study area because they are responsible for the provision of the needs of the family. This assertion corroborated the submission by Babalola (2012) who reported a growing involvement of men in African walnut production than women. The observed dominance of age group 31 -50 years in walnut enterprise might not be unconnected with the fact that this age group are very agile, active and physically strong to do the odious or high energy demanding work such as farming. This observation agrees with the findings of Roland and Oyelana (2014) who stated that majority of the people who get involved in non-timber forest product extraction were within the age bracket 41-50 years.

The observed low level of literacy among the respondents in the study area could be a major reason for low production of walnut in the study area as revealed by the result in table 4 where only 23.33 % of the respondents produce more than 100kg of walnut per year which they usually sell in bits. The problem here is that the farmers do not give priority attention to the crop; they usually plant it inside their cocoa plantation with majority having less than 20 stands. Because of their low level of education they didn't give it a thought that they can increase their production if they cultivate it on a large scale. This assertion agreed with the findings of Awolala and Ajibefun, (2012) who concluded that low level of literacy may likely deprive farmers the access to better information on modern production techniques and marketing.

The study revealed that majority of the respondents in the study area cultivates less than 5 hectares of farm land per annum. This low level of cultivation could have been due to the fact that the respondents in the study area probably do not have access to large area of land for farming activities as revealed by method of land ownership which is mainly through inheritance (Table 3). This mode of land ownership is usually characterized by land fragmentation thereby reducing the quantity of land available to prospective farmers among family members. The effect of this is low production as revealed in table 4 were majority of the respondents produce less than 100kg of walnut per year. Also overdependence of the majority of the respondents on family members for labour which in most cases are not more than 6 member including children (Tables 2) might be another factors which could have responsible for low quantity of walnut production in the study area.

Observations from this study revealed that walnut have contributed to the livelihood of the people in the study area both socially and economically. On the uses of the walnut, majority of the respondents mentioned that the walnut is usually consumed as food (snacks) when cooked. Also some believed that it has medicinal function as anti-venom against snake bit when eaten raw. Walnuts are usually cooked dried and stored in containers and usually distributed to people as gift during cultural festival. Observation also revealed that walnut is used to entertain visitors in homes among villagers. On economic contribution 27.60 % of the respondents opined that walnut serves as source of income for their household. The study also revealed that about 60 % of the respondents in the study area generates more than ₦20,000 per annum from the sale of walnut. This amount is a big money to most rural economy in the sense that the product itself is perceived to be a by-product from their cocoa plantation and that little or no cost is incur on its production except for the cost of transporting the product from farm to the village.

The study highlighted some challenges faced by the respondents in the production of walnut in the study area to include lack of storage facility, theft, drought, high cost of transportation and pest. This observation is in line with that of Jamala *et al.*, (2013) who reported lack of modern equipment for processing and storage of farm produce among others as a major production problem among farmers.

CONCLUSION

Findings from this study have revealed that walnut production in the study area is basically through intercropping system in cocoa plantation. The study also revealed that number of walnut stand in respondents' farm is largely dependents on the size of the cocoa plantation and since most of the respondents are peasant farmers who seldom cultivate more than 5 hectares of land; the quantity of African walnut production in the study area is very low. It was also revealed that Africa walnut is an important crop that plays significant role in the support and maintenance of livelihood of rural people socially, culturally and economically in the study area. Also the study revealed that farmers in the study area are faced with some challenges such as lack of storage facilities, theft and drought among others. Consequent upon the above findings, Government through extension officers should enlightened farmers on how to embarking on large scale cultivation of the crop in other to increase their production.

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