

Economic Analysis of Palm Wine Production in ILA Local Government Area of Osun State, Nigeria

Isaac, O. Oyewo¹, Adekunle, Q. Yusuff², Esther. O. Oladipupo-Alade³, Ajoke. R, Aduloju⁴, Hafsoh. O Shaib-Rahim⁵, Afolake, E. Robert⁶

^{1,4,5,6}Department of Agricultural Technology, Federal College of Forestry, Ibadan, Nigeria

²Department of Horticulture and Landscape Technology, Federal College of Forestry, Ibadan, Nigeria

³Forestry Research Institute of Nigeria, Jericho Hill Ibadan Oyo State Nigeria

Abstract: The study was carried out to evaluate the analysis of palm wine production in Ila Orangun local government area of Osun State. Structured questionnaire and interview schedules were designed to obtain information on socio economic characteristics of palm wine tappers, factors influencing palm wine tapping, determinants of palm wine production and challenges encountered by palm wine tappers in the study area. Sixty palm wine tappers were randomly selected from six villages which includes Ila Orangun, Isinmi Olootu, Gaa Fulani, Oyi ayegunle, Ajaba, and Ejigbo Orangun. Data collected were analyzed using descriptive analysis (frequency and percentage) and inferential statistics. The result revealed that majorities (80.0%) of the tappers were male, 41.7% had no formal education, 80% of them were married and majorities (53.4%) were between the age ranges of 41-50 years. Most (73.7%) engage in tapping and production of palm wine for commercial purposes, 73.4% had production years of tapping experience range from 5-10 years, 91.7% of the palm tree tapped in this area are matured at 7 years of growing maturity, majority (71.7%) of the tappers do not mix additives with their palm wine. The multiple regressions revealed that number of palm trees tapped ($p = 0.001$), age of tappers ($p = 0.005$) and gender ($p = 0.001$) were the significant and major determinants of palm wine production in the study. Major challenges encountered by tappers in the study area include poor extension service (78.3%), inadequate capital (65.0%), poor marketing service (60.0%), inadequate credit facilities (55.0%), and poor storage facilities (55.0%). Palm wine tapping had contributed to the cultural and economic growth of the study area. It is however recommended that palm wine tapping should be encouraged and standardize so as to restructure the effective production of palm wine in the study area

Keywords: Economies, production, palm wine, Regression, Osun State

I. INTRODUCTION

Palm wine is an alcoholic and traditional beverages produced by the natural fermentation of sap of palm tree (family palmae). Due to its global popularity, palm wine is known by a variety of names in different countries to include “Emu funfun” in Nigeria, “Matango”, “Fitchuk” and “Mbu” in Cameroon, “Doka” in Ghana, “Toddy” in India, “Lambanong” in Phillipines, and “Panam culloo” in China. Palm wine is drunk in different part of Africa, Asia, and South America (Ndon, 2003). Palm wine is high in amino acids, potassium, magnesium, zinc

and iron. The palm wine/sap also has vitamin B1, B2, B3 and B6. Palm wine tapping activities and production processes are practiced in mostly the southern and western part of the country. Palm wine tapping, processing, and production are done indiscriminately (Obahiagbon and Osagie, 2007) it production constitutes one of the most important occupational engagements of the rural inhabitants in Ila Local Government area of Osun State and some other rural area of Osun State and some other rural area all across the country to include the southern part of the country. Traditionally, palm wine is deeply rooted in West African culture and traditions and thus is the most frequently consumed alcoholic beverages. Palm wine is commonly thought to be a very nourishing beverage drink which help with depression, fatigue, nausea, abdominal discomfort, and headache, promote lactation, treats conjunctivitis, and improve eyesight. Also some African traditional healers often make use of Palm Wine with medicinal herbs to produce a wide variety of remedies (Mbugbaw and Noorduyn, 2012). Palm wine from *Raphia spp* or *Eleasis guinensis* is mostly consumed fresh, and can also be distilled to make it strong alcoholic liquor which can also be used as baker's yeast (Ogbonna, 2000 and Akachuku, 2001). Palm wine is particularly grown along the swampy area of the tropical forest (Keay, 1965, Ewuim *et al.*, 2011). Palm wine growth requires high rainfall, high temperature (22-33⁰c), sunshine of not less than 5-7 hours and high relative humidity (Ndon, 2003).

The *Raphia* palm is hapaxanthic, that is, after a period of vegetative growth, it produces flowers and fruits only once and dies. Every part of the palm is economically useful. The leaves are used for various uses such as shelter, roofing, brooms, bamboo, raffia oil, baskets, raw materials for alcohol which are products found from *raphia* palm. The stem produces palm wine/sap which is consumed as beverages; the fermented sap could be distilled into a strong alcohol. Succulent oily larvae of weevils and beetles are obtained from infected palms and serve as delicacy; the trunk could serve as firewood. The mesocarp of the fruits yields edible oil (Otedoh, 1990). The Palm wine is mainly used and traded locally in regions where they are produced and contributes significantly to rural employments and income (Mann and Wendi, 2009). The wine/sap of the *raphia* palm is drunk by millions of people in the most Africa countries especially in Cameroon

and Nigeria, as beverages. The sap is colourless and sugary/sweet taste, the *Raphia* palm alone as contributes about 20% of the palm wine drunk in its fermented and as well as in its unfermented states, depending on the choice of the consumer (Obahiagbon and Osagie, 2007). The health implication of the wine/sap had been reported by various scholars, their report indicated that the palm sap could be used for the cure of malaria, treats conjunctivitis, measles, jaundice and improves eyesight and it also aid the flow of milk in nursing mothers (which promotes lactation). Africa traditional healers often make use of palm wine with medicinal herbs to produce a wide variety of remedies. Recent literature search revealed that in spite of the significance of *Raphia* palm wine in Nigeria, empirical studies on palm wine concentrate on Morphology, Chemical nutritive values, preservation techniques and health implication (Obahiagbon. 2009). Despite the income provided by *Raphia* palm tree to the palm wine tappers, there is paucity of information on the economics of palm wine production in the study area. Hence this study aims to bridge this information gap. Palm wine production account for about 47% of the total revenue of the entire community, which are domesticated not only for revenue, but for some other benefits. The benefits to include Medicinal purposes, source of foreign exchange, source of raw materials for industries such as the brewery industries, and also as source of employment (Adakaren *et al.*, 2001).

This research work, described the socio-economic of palm wine tappers and estimate the production function of palm wine production in the study area, examine the factors influencing the palm wine tappers in the study area and, identified major constraints and the challenges encountered by palm wine tappers in the study area. Palm wine tapping is very important in the study area as it generates income to the tappers who are basically rural dwellers (Adakaren, 2014). The palm wine tappers as any other entrepreneur were typically able to produce so as to satisfy household food needs or make profit or both. Nigeria is agrarian society with about 70% of her over 140 million population engaged in agriculture (CBN 2006). However, the agricultural sector of Nigeria has failed to keep with the demand of households and industries to farm produces as food or raw materials (Nwaiwu, *et al.*, 2010). Agriculture is the most assured engine of growth and development and also a reliable key to industrialization. Nigeria is one of the Africa best producers of palm wine most especially from Ila Orangun in Osun State. Palm wine has being one of the traditional beverages with good and quality production. According to Ajibefun and Daramola (2003), resources must be utilize much more effectively with more attention paid to eliminating waste, this will definitely lead to an increase in production and income of the farmers

Research objectives are to: examine the socio economic characteristics of palm wine tappers, examine the factors influencing palm wine tapping, analyze the determinants of palm wine production and examine the challenges encountered by palm wine tappers in the study area.

II. METHODOLOGY

2.1 Study area

The study was conducted in Ila Local Government Area of Osun State Nigeria, where Ila Orangun town is the headquarter. The local government area has an estimated population of about 62,049 as at the 2006 census (NPC, 2006). The area has a land mass of 303km², the area is a major agricultural practicing zone and it is located in the western part of the country, lying in the latitude 8⁰1'N and 4⁰,54⁰ E. It's found within the tropical climatic region.

The local government area has a very great potential for agriculture, and is suitable for food and tree crops, and livestock farming. It has an average rainfall of 1257mm (5-7 hours) and relative humidity range from 84.5% in June to September about 78.5% in December and January. Crops widely grown in the area are vegetables such as waterleaf, palm trees and others includes cassava, maize, yam, pepper, garden egg and cucumber. In the area most of the rural dwellers engage in farming, hunting and most often engage in palm wine tapping primarily. About 50% of the population engages in palm wine tapping and production. Ila local government covers the area of Ila township and some other villages to include Ila-orangun, Ajaba, Isinmi olootu, Gaa fulani, Oyi-ayegunle, and Ejigbo-orangun. This area has a fertile land and thus makes the areas suitable for agriculture.

2.2 Sampling procedures

Ila local government area of Osun State was purposively selected as the study area, due to the high level of agricultural activities, rurality and known for Palm wine production. Six villages were randomly selected namely Ila-orangun, Oyi ayegunle, Ejigbo Orangun, Ajaba, Gaa Fulani, and Isinmi Olootu. 10 respondents were randomly selected from each of the community making a total of sixty respondents for the study as well structured questionnaires were administered to them carefully.

2.3 Data collection

Primary data and personal interview were used to elicit responses from the respondents who are mainly farmers that engage in palm wine tapping, processing, production and marketing in the study area.

2.4 Data analysis

Descriptive statistics such as frequency mean and percentages were used to analyze the socio-economic characteristics of the respondents and multiple regression analysis to analyze the determinants of palm wine production in the study area.

Model specification

$$Y = f(x)$$

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + u$$

Where

Y = Palm wine output (litres)

X1 = Educational level

X2 = Number of palm tree

X3 = Age of tappers

X4 = Year of production experience

X5 = Gender

X6 = Age of palm tree

a = constant, b = parameter estimated, x = error term

III. RESULTS AND DISCUSSION

3.1 Socioeconomic characteristics of palm wine tappers in the study area

Table 1: presents the socioeconomic characteristics of palm wine tappers in the study area. The distribution of the respondents by gender reveals that majority of the palm wine tappers were male representing 73.3% of the respondent which implies that tapping activities dominated by the men because it requires much strength and agility while the female are 26.7% of the respondents. Gender may determine the ability to perform some physical work. It is generally believed that men are more actively productive and efficient in tapping due to the fact that females are restricted from climbing or felling down of palm trees and because tapping requires carrying out strenuous work during palm wine production. While 34.9% of the respondents are between the ages 30 and 40 years, 53.4% are between the ages of 41 and 50 years, 10.0% of the respondents are between the ages of 51 and 60 years and 1.7% of the respondents are above 60 years, with the mean age of 44.7 years. The table also revealed that 73.3% of the respondents were married, 15.0% are widowed while only 6.7% were single and 5.0% are divorced. Most of the tappers are married, and thus implies that large number of tappers could have children who can serve as source of family labor and thereby enhance the production of palm wine tapping. The distribution of respondents by educational level reveals that majority 41.7% of the respondents had no formal education, 35.0% had primary education, while 16.7% had secondary education and 6.7% of the respondents had tertiary education. About 86.7% of the tappers had a household size of between 2-5, while 13.3% had household size of between 6 and 7 and mean of 4.5 persons. Distribution of the respondents by years of experience indicates that 73.3% of the respondents had between 5-10 years of production experience, 11.7% had between 11-15 years, 10.0% had between 16-20 years while 5.0% of the respondents had above 21 years of experience with a mean of 15 years. This is a sustained number of years which implies that the tapping business could be improved as a means of income and sustenance among the farmers.

3.2 Factors influencing palm wine tapping in the study area

Table 2 revealed the factors influencing palm wine tapping in the study area. Majority (71.7) % of the respondents claimed they don't mix their palm wine products with additive while 28.3% of the respondents agreed that they mix additives with their palm wine product. However, all of the respondents (100%) were aware of the health implication of palm wine. All (100%) of the respondents agreed that the marketing rate of palm wine is growing faster in the area. All 100% of the respondents agreed that rainfall as a factor that influence palm wine tapping in the study area, Also all 100% of the respondents make use tools (modern or local) during the tapping, production and processing of palm wine in the study area. Also it was revealed that majority 80% of the respondents agreed to capital as one of the major factor that influence palm wine tapping in the study area while 20% Of the respondents disagreed to capital as a factor that influence palm wine tapping in the study area.

3.3 Determinants of palm wine production in the study area

Table 3 revealed that number of palm wine tree tapped was significant at 1% and had a positive relationship to the amount of palm wine quantity output, this shows that the more the number of palm trees tapped increases, there will be a proportionate increment in the level of palm wine produced by the palm wine tappers. The coefficient of age was positively significant at 5% to the level of palm wine output produced, thus indicating that as the age of the palm wine tappers increases the better they become on palm wine production the more and better the output. Gender was negatively signed and significant at 1% level, this shows that gender inequality reduces the palm wine output because of the tedious routine of the palm wine tapping meanwhile the female involved majorly in the marketing of palm wine produced in the study. R^2 was 0.66 indicating 60% in the level of variation in the model specified for the study.

It was however, concluded that substantial number of palm tree, age of tappers, and gender were the major determinants of palm wine production in the study area.

3.4 Challenges Encountered by Palm Wine Tappers in the Study Area

Table 4 shows various challenges encountered by palm wine tappers in the study area. According to the findings the result for this table is summarized as follows ; 55% of the respondent agreed to inadequate credit facilities while 45% disagreed, 90% disagreed to high climatic condition while 10% agreed, 55% agreed to poor storage facilities while 45% disagreed, 65% agreed to inadequate capital while 35% disagreed, 60% of the respondent agreed to poor marketing services while 40% disagreed, 78.3% agreed to poor extension service while 21.7% disagreed, 100.0% disagreed to high cost of transportation, 51.7% of the respondent disagreed to poor road network while 48.3% agreed, 100% of the respondents disagreed to government policy as challenges encountered by

palm wine tappers in the study area, 100% of the respondents disagreed to cost of production as a challenge encountered by palm wine tappers in the study area, 98.3% of the respondents disagreed to fluctuation in price of additive as a challenge faced by palm wine tappers in the study area.

IV. CONCLUSION AND RECOMMENDATIONS

This study revealed that palm wine tapping and production in Ila Orangun local government area is mostly done by males, the tappers in the study area had a mean age 44.7 years, which indicates that most of the palm wine tappers are youths. Also (41.7%) tappers had low educational level and had household size mean of 5 persons. The result also revealed that tappers in this area encounter some challenges which are: inadequate credit facilities, high climatic condition, poor storage facilities, inadequate capital, poor/bad extension service and so on: hence tappers cannot meet up with the basic requirements to sustain palm wine tapping and production in the study area due to the various challenges encountered by palm wine tappers in the area. It is also concluded that substantial number of palm tree, age of tappers, and gender were the major determinants of palm wine production in the study area. In accordance with the findings, it was therefore recommended that:

1. Government should help to tackle the various challenges encountered by the palm wine tappers so as to improve palm wine tapping and production in most producing communities and thereby contribute to the cultural development of the producing communities.
2. Tappers should be encouraged to belong to association, this would enable them to pull resources together, raise loan and purchase needed facilities so as to enhance palm wine tapping and production in the study area.

3. Government should assist tappers in terms of finance, such as allocation of loan to tappers so as to enhance the palm wine production in this area.

REFERENCES

- [1] Adakaren, B., and Eneh, F. K. (2001): Economic Importance of Raphia Palms in Nigeria; A Review. *Journal of Applied Sciences* 5(4): 3154-3166.
- [2] Adakaren, B (2014). Raphia palm wine marketing in South-South Nigeria. A thesis submitted to the Department of Agricultural Economics, University of Nigeria, Nsukka, for the award of Doctor of Philosophy (Ph.D) Degree in Agricultural Economics. Pp 129
- [3] Ajibefun, I.A, Daramola, A.G (2003). Determinants of technical and allocative efficiency of micro-enterprises: Firm-level evidence from Nigeria. *African Development Bank*. 353-395.
- [4] Akachukwu, C. O. (2001): Production and Utilization of Wine Palm (*Raphia hookeri* Mann and Wendl), An Important Wetland Species Occasionally Visited by Honey Bees. *Proc. Aquatic Sci.* Pp 282-297
- [5] Central Bank of Nigeria CBN (2006). Annual Report and Statement of Accounts Abuja Nigeria. <http://www.cenbank.org>
- [6] Ewuim, S. C, Akunne, C.E, Anumba, A.I, Etaga, H.O (2011). Insects associated with wine from raffia palm (*raphia hookeri*) in Alor, Nigeria. *Animal Research International*. 8(1): 1328-1336.
- [7] Keay, W. J. (1965). *An Outline of Nigerian Vegetation*. Federal Ministry of Information Lagos, Nigeria.
- [8] Ndon, D. S. (2003): *The Raphia Palm*. Concept Publications Ltd, Lagos, Nigeria. P17 NIFOR Pull
- [9] Nwaiwu, I, Odii, M, Ohajianya, D, Eze, C, Oguoma, N, Ibeke, C, Henri-Ukoha, A, Kadiri, F, Amaechi, C, Oguh, J. (2010). Comparative Analysis of the Productivity of Sustainable Cassava Farming under External and Internal Input use in Imo State, Nigeria. *New York Science Journal*. 3(10): 12 -16
- [10] Obahiagbon, F. I and Osagie, A.U (2007). Sugar and macrominerals composition of sap produced by *Raphia hookeri* palms. *African Journal of Biotechnology*. 6 (6): 744-750
- [11] Obahiagbon, F.I (2009) A review of the origin, morphology, cultivation, economic products, health and physiological implications of raphia palm. *African Journal of Food Science*. 3(13): 447-453.
- [12] Ogbonna, K. H. (2000): Nigerian Raphia Palm Sap: The Past, Present and Future. *Afr. J. Env't. Studies*. 1 and 2, 53-58
- [13] Otedoh, M.O (1990). Sweet Raphia Palm Wine. *The Nigerian Field*. 55: 59-64

Table 1: Socio economic characteristics of palm wine tapper

Variable	Frequency (n=60)	Percentage	Mean
Age			
30-40	21	34.9	
41-50	32	53.4	
51-60	6	10.0	
61 and above	1	1.7	44.7
Gender			
Male	44	73.3	
Female	16	26.7	
Marital status			
Single	4	6.7	
Married	44	73.3	
Divorced	3	5.0	
Widowed	9	15.0	
Educational level			
No formal education	25	41.7	
Primary education	21	35.0	
Secondary education	10	16.7	
Tertiary education	4	6.7	
Household size			
2-5	52	86.7	
6-7	8	13.3	4.5
Type of farming system			
Commercial	45	75.0	
Subsistence	9	15.0	
Others	6	10.0	
Years of tapping and production experience			
5-10	44	73.3	
11-15	7	11.7	
16-20	6	10.0	
21 and above	3	5.0	15.0
Age of palm tree (years)			
5	2	3.3	
6	3	5.0	
7	55	91.7	6.0
Palm wine output (litres)			
4	11	18.3	

5	20	33.3	
6	19	31.7	
7	10	16.7	5.5

Table 2: Factors influencing palm wine tapping in the study area

Variable	Frequency (n=60)	Percentage
Additives		
Agreed	17	28.3
Disagreed	43	71.7
Health implication		
Agreed	3	5.0
Disagreed	57	95.0
Rainfall		
Agreed	60	100.0
Marketing rate		
Agreed	60	100.0
Tools		
Agreed	60	100.0
Labour		
Hired	30	50.0
Family	21	35.0
Both	1	1.7
None	8	13.3
Capital		
Agreed	12	20.0
Disagreed	48	80.0

Table 3: Determinants of palm wine production in the study area

Variable	Beta	Standard error	T. Value	significance
(constant)	-0.266	2.802	-0.095	0.925
X ₁ Educational level	0.075	0.178	0.443	0.659
X ₂ Number of palm tree	0.062**	0.015	4.151	0.000
X ₃ Age of tappers	0.090*	0.036	2.498	0.016
X ₄ year of production experience	0.045	0.040	1.129	0.264
X ₅ Gender	2.167**	0.452	-4.792	0.000
X ₆ Age of palm tree	0.236	0.375	0.630	0.532
R ²	0.66			

Note (***) = 1% significant level, (**) = 5% significant level.

Table 4: Challenges Encountered by Palm Wine Tappers in the Study Area

Challenge	Frequency (N=60)	Percentage
Agreed	33	55.0
Disagreed	27	45.0
Harsh climatic conditions		
Agreed	6	10.0
Disagreed	54	90.0
Poor storage facilities		
Agreed	33	55.0
Disagreed	27	45.0
Inadequate capital		
Agreed	39	65.0
Disagreed	21	35.0
Poor marketing services		
Agreed	36	60.0
Disagreed	24	40.0
Poor extension		

services		
Agreed	47	78.3
Disagreed	13	21.7
High cost of transportation		
Agreed	60	100.0
Poor road network		
Agreed	29	48.3
Disagreed	31	51.7
Government policy		
Disagreed	60	100.0
Cost of production		
Disagree	60	100.0
Fluctuation in price of additives		
Agreed	1	1.7
Disagreed	59	98.3