Original Research Article

Assessment of consumption and income generation between palm wine and other industrial beverages in Cross River State, Nigeria

Abstract

The study was conducted to provide information on the level of consumption and income from palm wine and other industrial beverages in Cross River State, Nigeria. Data were collected from 82 sampled palm wine retailers in three geopolitical zones in the State. Semi-structured questionnaire, personal observations and focus group discussions were used to obtain data from retailers. Data were analyzed using both descriptive and inferential statistics. The result of the study showed that consumption level of palm wine per day in the zones were in the order, Northern (33.3 L) > Central (24.8 L) > Southern (19.4 L). However, the consumption levels of palm wine from the Central and Southern Zones were not significantly different (P > 0.05) from each other. The Consumption level of other alcoholic beverages; Harp, Goldberg, Origin, Dry gin, Heineken, Stout, Gulder, and Star per day in the zones were in the order Northern (23.9 L)> Central (20.4 L) >Southern (17.6 L). The income level from palm wine was ₦1845.54, ₦1538.40 and ₦837.60 from the Northern, Central and Southern Zones, respectively. Total Performance Index based on taste, availability, and cost shows that mean daily consumption level of palm wine was higher than all the other alcoholic beverages in the study area. The study recommends that Government and other development stakeholders on economic and environment should play greater role in promoting potential entrepreneurship in palm wine as a viable alternative source of livelihood through creation of awareness and better incentives for sustainable management of this natural forest resource.

Key Words: Palm wine, industrial beverages, consumption, income

1. Introduction

Forests provide excellent resources that support indigenous peoples' livelihood; basically for food medicine, construction material, artistic material, cosmetic, fuel wood and artisanal industries which are key important source of income for the rural community [1]. Faye *et al.* [2] and Forest like the sister agriculture is the backbone of most rural community's economy and a major source of livelihood for rural households, with about three quarters (70%) of the forest indigenous population relying on this sector for a living. In broader sense, they depend upon forests directly for timber, non-timber products, and indirectly for recreational experience and for air and water quality, biodiversity, carbon sequestration, and other ecological services [3, 4, 5]. Also that, small scale forest productions and marketing play central role in economic development, both in

supplying a significant portion of domestic food supplies and in generating income for low-income families.

Palm wine is an alcoholic beverage from the sap of various species of palm tree such as the oil palm tree, raphia palm, date palms and coconut palms [6]. In Cross River State and in most southern state in Nigeria, the palm sap/wine is the major product of both oil and raphia palms as major occupational engagements of the rural dwellers for consumption and income [7, 8]. Moreover, palm wine tapping is an appropriate and well-accepted farming technology practice by wider society either on full or part time bases and is best suited to extensive range of ecosystems of tropical Africa like Cross River State. Historically, palm wine tapping and consumption was discouraged by most colonial and post-colonial governments because it prevented less economically useful activities and promoted local alcohol consumption (Ikegwu [9] citing Dalibard [10]).

The fresh palm wine is now bottled, preserved and sold nationally in supermarkets or exported to other countries [11]. This is particularly seen in Akpabuyo LGA, where a raphia pasteurized and bottled palm wine industry is established like other organized alcoholic beverages. This goes a long way employing more tappers who are sure of selling their products as well as those employed by the palm wine pasteurized bottling company. With the proliferation of palm wine bars and the existence of palm wine pasteurization industry in Akpabuyo- Cross River State, a reasonable numbers of people are employed in the production and marketing processes of this forest based enterprise [7].

In Cross River State, the existing income generation capacity of palm wine as compared to its immense bio-geographical macro and micro level potential is not encouraging. The knowledge gap on domestic palm wine consumption and income is high. Even though palm wine is economically and socially important, palm wine consumption and income level in association with other alcoholic beverages have not yet been studied. It is against this background that the study was conducted to provide information on consumption level of and income from palm wine and other industrial alcoholic beverages traded in Cross River State for decision and policy making.

2. Methodology

2.1. Study Area

The study was conducted in Cross River State, Nigeria. Cross River State lies between latitude 4°30'0" N and 7°0'0" N and longitude 8°30'0" E and 9°30'0" E of the Greenwich Meridian (Figure

1). It shares common boundaries with the Republic of Cameroon in the East, Benue State in the North, Ebonyi and Abia States in the West, Akwa Ibom State in the South-West and the Atlantic Ocean in the South [12]. Cross River State has a tropical humid climate with distinct wet and dry seasons occurring in April-November and December-March, respectively. From the location; the state enjoys a tropical climate, with exception of Obudu Plateau at an altitude of 1,595.79 m above sea level, with a prevailing temperate climate. The State records heavy rainfall during the wet season (April-November) and the annual rainfall varies from 1800 mm to 4000 mm and the annual temperature from 10°C to 32°C. The rainfall decreases from the south 3500 mm in the coastal region to 1500 mm in the northern part of the state [13].

The State is composed of three (3) geopolitical zones; the Northern, Central and Southern geopolitical zones. Administratively, there are eighteen Local Government Areas (LGAs) in Cross River State [14, 15].

The major occupations of Cross Riverians include farming, fishing, hunting, extraction and gathering of timber and non-timber forest products. Specific examples are; rubber, cocoa, cashew, castor seeds, yams, cocoyam, cassava, maize, melon, oil palm, raphia palm, plantain, bush mango (Ogbono), *Dacrodyes edulis* (African pear), and *Chrysophylum albidium* among others. Most socio-cultural activities in the State rely on forest derivatives, inclusive of palm wine. The state is blessed with flora and fauna in abundance. At present, the state has about 50% of the total remaining tropical high forests in Nigeria [14]. These forests are made up of the Forest Reserves, Community forests and Cross River National Park forests.

2.2. Sampling Technique

A multi-stage sampling technique was employed for the study. The State was stratified into three geopolitical zones namely: Northern, central and southern zones, each comprising 5, 6, 7 LGAs, respectively. Using 30% Sampling Intensity (SI), two LGAs were selected from each zone giving a total of six LGAs for the study. Three council wards from each LGA and one community from each council ward were purposively selected based on high evidence of presence of organized palm wine business. In each of the sampled LGAs, 30% of organized palm wine retailers were purposively selected for the study as shown in Table 1. Information on organized palm wine retailers was obtained from the officials of the palm wine sellers association (Plate 1) in each of the localities. A total of 82 retailers of palm wine were sampled for the study (Plate 2 and 3).

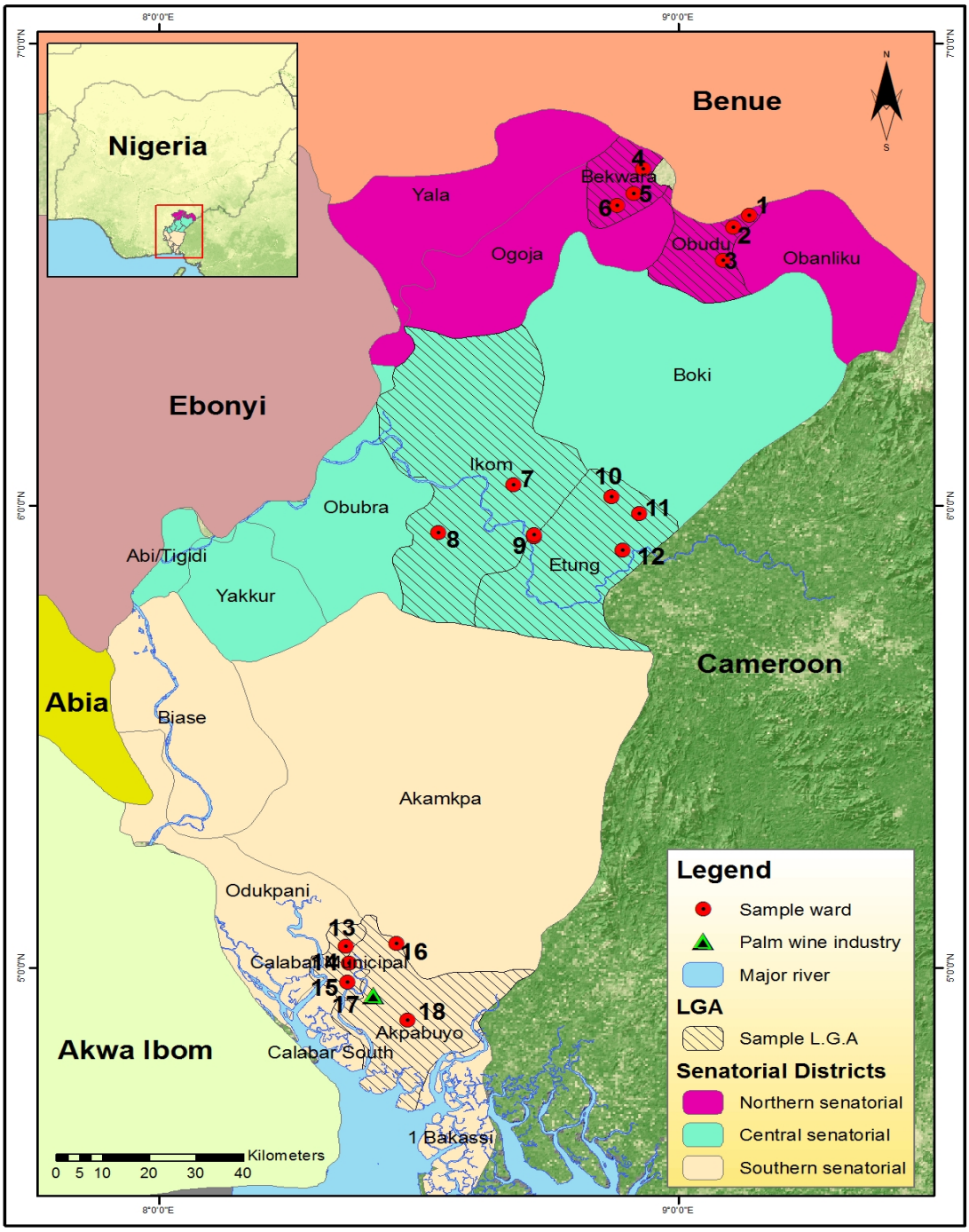

Fig 1: Map of the study area

Table 1: Summary of the sampling procedure

Geopolitical zones /LGAs sampled	Number of Retailers	Retailers sampled (30%)
OBUDU	72	22
BEKWARRA	54	16
SUB-NORTHERN GEOPOLITICAL DISTRICT	126	38
IKOM	49	15
ETUNG	34	10
SUB-CENTRAL GEOPOLITICAL DISTRICT	83	25
CALABAR MUNICIPALITY	28	8
AKPABUYO	36	11
SUB-SOUTHERN GEOPOLITICAL DISTRICT	64	19
TOTAL	273	82

Plate 1: Organized Palm Wine Sellers Association in Obudu (OBUDU)

Plate 2. Palm wine retailing in plastic containers in the study area

Plate 3. Palm wine retailing in sealed bottles

2.3. Data Collection

Data were collected through sets of semi-structured questionnaire, personal observations and focus group discussions. The semi-structured questionnaire gave interviewees opportunity to express their views freely, thus enhancing the objectivity of the results. Focal oral interviews, informal discussions and case studies were used to supplement information collected through questionnaires. The data collected included (i) profitability of palm wine and other Alcoholic beverages, (ii) consumption, and (iii) income level in the business.

2.4. Data Analysis

Data obtained were analyzed using descriptive statistics, inferential statistics and economic tools. Descriptive statistics utilized were frequency distribution, percentages, means, standard deviation, and tables. One way analysis of variance (ANOVA) was used to analyze the variation in the level of consumption and income from palm wine and other alcoholic beverages among the geopolitical zones in the study area. The level of consumption and income of the alcoholic beverages were significantly different from each other if $p < 0.05$. If significant difference occurred, the test of comparison of mean values (LSD) was used to compare mean values of the level of consumption and income of the alcoholic beverages.

The mean consumption level of palm wine based on taste, availability and cost was determine using the Total Performance Index (**TPI**) as used by O'Neill [16]: TPI was expressed as follows:

$$TPI = \frac{\sum A + B + C}{3}$$

Where:

A = mean value of taste of palm wine

B = mean value of availability of palm wine and

C = mean value of cost of palm wine

3. Results

3.1. Level of consumption of, and income from palm wine vis-à-vis other industrial beverages among geopolitical zones in Cross River State

Consumptions of palm wine per day were 33.3 L, 24.8 L, and 19.4 L in Northern, Central and Southern Zones respectively. The consumption level of palm wine from the Central and Southern Zones were not significantly different ($P > 0.05$) from each other, but were significantly different ($P < 0.05$) from that in the Northern Zone. Consumption levels of other alcoholic beverages were 23.9 L, 20.4 L, and 17.6 L from the Northern, Central and Southern Zones respectively. Consumption levels in the Northern and Central Zones were not significantly different ($P > 0.05$) from each other, but significantly different from that in the Southern Zone (Table 2).

Similarly, the income levels from palm wine sales were ₦1845.54, ₦1538.40 and ₦837.60 from the Northern, Central and Southern Zones, respectively. The income from palm wine in the Northern and Central Geopolitical Zones were not significantly different ($P > 0.05$) from each other but significantly different from that in the Southern Zone. Furthermore, income from other alcoholic beverages were; ₦4401.60, ₦3847.60, and ₦3847.00 from the Northern, Central and Southern Zones respectively (Table 2). The income from other alcoholic beverages among geopolitical zones were not significantly different ($P > 0.05$) from each other; implying that income from these beverages were comparable among geopolitical zones

3.2. Total performance indices of palm wine and other alcoholic beverages

Three criteria; taste, availability and price of the commodity were used during the study. Based on these criteria, palm wine recorded the highest TPI of 4.88 $cm^{3.}$ Thus comparing consumption of palm wine and other alcoholic beverages based on criteria in percentages (%) shows that on taste, palm wine had the highest percentage of 24.74%, followed by others (Harp (H), Goldberg (Gb) and Origin (Or)), Dry gin, Heineken, Stout, Gulder and Star (Table 3). Similarly, based on availability, palm wine also had the highest percentage of 23.52%, followed by others (Harp, Goldberg and origin) Dry gin, Stout, Heineken, Gulder and Star, with the percentages ranging from 11.955 to 13.65%. Also, based on cost, palm wine still had the highest percentage of 24.02%, followed by dry gin, others (Harp, Goldberger and origin), Stout, Guilder, Heineken and Star. Thus, the mean daily consumption level of alcoholic beverages based on the three criteria shows that palm wine performed better than all the other alcoholic beverages in Cross River State.

Table 2. Consumption of and income from palm wine and other alcoholic beverages among the geopolitical zones in Cross River State

Geopolitical zone	Palm wine				Other alcoholic beverages			
	N	Quantity Sold/Day	Mean prevailing Unit Price(₦)	Mean Total Income (₦)	Quantity Sold/Day	Mean prevailing market Price/unit (₦)	Mean Total Income (₦)	
Northern	38	33.3±17.2[a]	66[b]	1845.4[a]	23.9±10.3[a]	200[b]	4401.6[a]	
Central	25	24.8±5.3[b]	71[a]	1538.4[a]	20.4±11.3[ab]	200[b]	3849.6[a]	
Southern	19	19.4±6.4[b]	59[c]	837.6[b]	17.6±9.6[b]	240[a]	3847.0[a]	
df		2	2		2	2		
F.stat		8.90	18.70		2.50	113.80		
LSD		0.00	0.00		0.09	0.00		

Level of significance = 0.05.,

N = Number of respondents

Note: Means in the same column with same alphabets superscripts are not significantly different from each other.

Table 3: Total performance indices of palm wine and other alcoholic beverages in Cross River State

Alcoholic beverages	Consumption level Based on Taste(L)		Consumption level Based on Availability(L)		Consumption level Base on cost(L)		A,B,&C = D	TPI =D÷3	Ranking
	A:Mean±SD	a:%	B: Mean ±SD	b:%	C: Mean ±SD	c:%			
Star	2.26±1.193	11.41	2.47±1.294	11.95	2.41±1.232	11.84	7.14	2.38	7
Gulder	2.38±1.199	12.01	2.55±1.210	12.34	2.5±1.253	12.28	7.43	2.47	6
Stout	2.46±1.173	12.42	2.66±1.318	12.88	2.58±1.331	12.67	7.7	2.57	4
Heineken	2.46±1.305	12.42	2.59±1.390	12.54	2.4±1.341	11.79	7.45	2.48	5
Dry gin	2.57±1.257	12.97	2.71±1.259	13.12	2.84±1.278	13.95	8.12	2.71	3
Palm wine	4.90±0.383	24.74	4.86±0.407	23.52	4.89±0.398	24.02	14.63	4.88	1
Others (H,Gb,Or.)	2.78±1.320	14.03	2.82±1.366	13.65	2.74±1.425	13.43	8.3	2.77	2

Note:

Mean values represent mean responses of respondents per consumption criterion

4. Discussion

More volume of palm wine was consumed than other alcoholic beverages in all the three geopolitical zones of the study area. The daily quantities of palm wine consumed in the Northern, Central and Southern parts of Cross River State, (23.9 L, 20.4 L, and 17.6 L, respectively) were well comparable to the 20 L, 15 L, 23 L, and 30 L of raphia palm wine consumed in Ehume, Ogeide, Okuoke, and Sapele, respectively, in Southern part of Nigeria reported by Aiyeloija *et al.* [17]. On the over hand, the mean total incomes of ₦4401.60, ₦3849.60, and ₦3847.0 obtained from this study were lower than the monthly profit of ₦12,000.00, ₦10,000.00, ₦13,800 and ₦9,000 obtained by Aiyeloija *et al.* [17].

The preference of palm wine over other alcoholic beverages was based on the attributes of taste, availability, and cost. This finding is in consonance with the findings of Ogbeide and Ele [18] that ranked taste of palm wine above the attributes of color, country of origin, packaging, label, maker and grape/fruit as the most important factor influencing palm wine purchase and consumption decision. This finding also agrees with the study of Aiyeloija *et al.* [17] that raphia palm wine is preferred among the people of Sapele LGA because of its distinctive taste than its intoxicating power, availability of the product and price. The finding is also supported by the works of Koewn and Casy [19] that taste of wine is the most important attribute preferred by consumers in Northern Ireland. Cohen and Cohen [20] in their study on the relationship between taste and consumer choice of wine asserted that taste has a strong relationship with choice.

The relatively larger volume of palm wine being consumed in the study area over industrial beverages could be attributed to its lower prices occasioned by its short shelf life and local production processes. This finding agrees with the study of McKee *et al.* [21] and Lang *et al.* [22] that locally produced traditional alcoholic beverages tend to be considerably cheaper than their western-style, commercially produced counterparts and are thus most likely to be consumed by those who are on the margins of society, are very heavy drinkers or are dependent on alcohol. They also asserted that in spite of the higher price, industrially produced alcoholic beverages are gaining popularity in many countries.

The relatively higher income from industrial beverages over palm wine could perhaps be explained by the local poor production processes, fragility and very short shelf life due to fermentation and packaging and local promotion status. Thus, Omofonmwan *et al.* [23] asserted that palm wine marketing in Nigeria is dominated by small scale producers and marketing with little or no technology on preservation hence marketer's volume of processed palm wine marketed in relation to other alcoholic beverages is usually smaller and highly seasonal with preservation challenges.

5. Conclusion

Assessment of consumption and income generation between palm wine and other industrial beverages in three geopolitical zones in Cross River State, Nigeria indicated that palm wine was consumed on a daily basis more than other alcoholic beverages in the State. However, the marketing margin from other alcoholic beverages was higher than the marketing margin of palm wine due to its lower unit price, perishability, poor storage and processing techniques. Taste of palm wine is the most important attribute influencing its purchase and consumption decision. Palm wine business is a profitable venture capable of sustaining livelihoods, therefore government and other development stakeholders on economic and environment should play greater role in promoting potential entrepreneurship in palm wine as a viable alternative source of livelihood through creation of awareness and better incentives for sustainable management of this natural forest resource. Recommendation is made on curtailing human activities capable of destroying palm trees.

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