



Marketing of fuelwood in Bida Local Government Area of Niger state, Nigeria

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ABSTRACT

This research analyzed the marketing activities of fuelwood in Bida local government area, Niger State. A multi-stage sampling technique was used for the study. In the first stage, purposive sampling was used to select five districts (Banyagi, Nassarafu, Banwuya, Sabongida, and Bangaie), two markets from four districts and three markets from Banwuya, giving a total number of 11 markets. In the second stage, simple random sampling was used to select 20 respondents from each of the four districts and 40 respondents from Banwuya markets which gave a total sample size of 120 respondents. Structured questionnaire and oral interviews were used to generate data. Data collected were analysed using descriptive statistics and gross profit margin. The result obtained showed that, female (93.3%) are the major actors in the marketing of fuelwood; the average age of the respondents was between 31- 40 years (36.7%), married (67.5%) with household size of 11-15 members (30.8%). Majority had Quranic education (61.7%) and fuelwood business as their occupation (60.0%). Most marketers source their products from the forest (53.3%) and had weekly sale revenue of ₦89,250.00, total cost ₦46,450 and gross profit margin of ₦42,800 per week. However, the return on investment (ROI) showed that, fuelwood marketers incurred 47.96% from their business. Cost of labour and transportation are the major constraint of fuelwood marketers. From this study, fuelwood marketing is a profitable business and has become part and parcel of their daily domestic energy utilization. There is need to identify fast growing tree species that are suitable for burning and the planting of such species should be emphasized.

Keywords: Fuelwood; marketing; constraints; socio-economic

INTRODUCTION

Forest is a source of livelihood for many farmers and rural household in developing countries, especially in sub-Saharan Africa. Forest is very valuable to the existence of man; early man depends on it for his survival, exploiting them for both their wood and non-wood product (Bauri *et al.*, 2015). The burning of wood is currently the largest use of energy derived from a solid fuel biomass (Bajwa *et al.*, 2018). Fuelwood is socially and environmentally acceptable in term of volume, fuelwood is the most important wood item consumed in Nigeria as well as in other West African countries such as Ghana, Cameroon among others. It accounts for about 95% of total wood consumed as fuel in Nigeria (Ebe,

2011). The list of NTFPs is inexhaustible specific as they include plants used for firewood, handicrafts and carvings, condiments, fodder, chemicals, medicines and even shade (Ibrahim *et al.*, 2016). Fuelwood is NTFPs used for industrial and domestic generation of energy especially in developing countries and felling of trees for fuel wood is now consider as the third most important economic activity of people in forest dependent areas followed by farming and animal rearing (FAO, 2012). NTFPs markets are informal with short supply chains based on time tested traditional or indigenous knowledge and skills. In local markets, various locations and households, the activities that make up the value and supply chain usually vary from one NTFP to another (Olajuyigbe *et al.*, 2020). Fuelwood is the fourth largest energy source providing about 13% of the total energy consumption globally (Magembe and Makonda, 2016). It is consumed mostly by the low income and middle-income households as well as operators of cottage and small-scale industries and commercial enterprises. Most of this fuelwood comes from forests mainly in the form of wood and charcoal. However, wood with higher density is better suited as fuel wood because it has high calorific value (Magembe and Makonda, 2016). The rural population traditionally relies on these fuel woods for both home consumption and for sales to the urban sector. Onyekuru *et al.* (2020) observed that over 70% of the total population of Nigeria relies on fuel wood or charcoal as their major source of energy for cooking and heating purposes. According to Hafeez (2012); Ayotebi, (2000); Isah *et al.* (2016); Chukwu, (2019); and Abebaw (2007), it was estimated that 70–79% of households use of fuelwood as a main source of energy.

Fuelwood is major business in the urban and peri-urban centers in Nigeria and according to (Henri-Ukoha *et al.*, 2021), fuel wood trading is a very profitable business. Fuelwood marketing like every other marketing enterprise involves the exchange between a buyer and a seller at a given price in such that the seller meets the total cost and the profit margin (Olugbire *et al.*, 2016). The use of fuel wood has been on the increase due to increase in cost and scarcity of alternative sources of energy, particularly Kerosene (Ebe, 2014). The forest has been a source of many human needs. The rural population traditionally relies on the forest for various food products (NTFPs) and fuelwood, both for own consumption and for sales to the urban sector (Azeez *et al.*, 2014).

In addition, firewood is consumed in large quantities in most parts of rural Africa. The situation in Nigeria today is such that price of kerosene and gas have gone up steeply along with the erratic supply of electricity so much that the urban communities have resorted to the firewood and plant straw for cooking (Merem *et al.*, 2018). Unless urgent measures are taken to discourage or reduce the consumption, there will be serious environmental degradation and consequences of unstable ecosystems. In fact, much has been known about the use, effect, exploitation and marketing of fuel wood but barely little is known about factors affecting its marketing especially in Bida Local Government area (LGA). For poverty reduction, the data generated from this study will serve as base-line information for future researchers. The major objective of this study is to examine the marketing of fuelwood in Bida LGA of Niger State.

MATERIALS AND METHODS

The Study Area

Bida is a Local Government Area (L.G.A) in Niger State, Nigeria with a land area cover of 1,698km² (656 sq. m). The local government has an area of 51 sqkm and a population

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of 318,300 at the 2022 population projection. It is located southwest of Minna, capital of Niger state. Bida lies on latitude and longitude $9^{\circ}05'N$ $6^{\circ}01'E$ / $9.083^{\circ}N$ $6.017^{\circ}E$, with the temperature *range* of $62^{\circ}F$ to $95^{\circ}F$. Bida has a Tropical wet and dry or savanna climate, Bida typically receives about 124.52 mm (4.9 inches) of precipitation and has 144.71 rainy days (39.65% of the time) annually. Tress found in Bida include *Vitellaria paradoxa*, *Vitellaria paradoxo*, *Parkia biglobosa*, *Khaya senegalensis*, *Vitex doniana*, etc. the soil in the area is extremely excellence for producing almost every agricultural crop or tree plants because the soil is loamy and very fertile (Mann *et al.*, 2007).



Figure 1: Map of Nigeria showing the study area

Sampling Procedure

The targeted population of this study was fuelwood marketers. A reconnaissance survey was conducted in Bida local government area of Niger state to identify where the various fuelwood selling points were concentrated. A multi-stage sampling technique was adopted. In the first stage, five (5) districts (Banyagi, Nassarafu, Banwuya, Bangaie and Sabongida) were purposively selected because of high concentration of fuelwood marketers. On the second stage, two (2) markets were also purposively selected from each district except in Banwuya, where three (3) markets were selected. In the third stage, 20 respondents (40 in Banwuya) were also randomly selected from each area which gave a total sample size of 120 respondents respectively.

Table 1: Sampling procedure and sample size

	1 st Stage (Purposive)	2 nd Stage (Purposive)	3 rd Stage (Random)
LGA	Districts	Number of markets	Number of Respondents per Market
	Banyagi	2	20
	Nassrafu	2	20
Bida	Banwuya	3	40
	Bangaie	2	20
	Sabon gida	2	20
	Total	11	120

Data Collection and Analysis

Data for the study were collected through the use of interview schedule using an outlined structure and open-ended questionnaire especially with the respondents who are not literate enough to complete the questionnaire. Data were collected on socioeconomic aspects, as well as the inputs and outputs of fuelwood marketing.

Data collected were analysed using both descriptive and inferential statistics. Profit margin was used to achieve the profitability of the fuelwood marketers.

$$GM = TR - TVC \dots\dots\dots 1$$

$$ROR = \frac{GM}{TR} \times 100 \dots\dots\dots 2$$

RESULTS AND DISCUSSION

Socio Economic Characteristic of the Respondents

Socio-economic characteristics of the respondent are important human attributes that plays a significant role in the marketing of fuelwood. The variables identified and analyzed is include sex (gender), age, marital status, household size, level of education, primary and secondary occupation (Table 2).

Table 2 shows that 93.3% of the respondents were female, this agrees with the findings of Jacob *et al.*, (2017) who observed that 92.0% of their fuelwood marketers were female in Uyo Capital City, Akwa Ibom State. This is an indication of the predominance of female directly involved in the fuelwood marketing, therefore, the low involvement of male in fuelwood business was due to the fact that most male in the region are limited due to their engagement in other income generation activities. This disagreed with findings of Ndaghu *et. al.*, (2011) who reported that male dominated the firewood trade in Yola, but contrary to the reports of Olugbire *et al.* (2016); and Jacob *et al.* (2017) which found 86% and 92% of the women in fuelwood marketing in Ibadan, Oyo state and Uyo, Akwa Ibom State respectively.

The results revealed that 36.7% were within the range of 31-40 years indicating youths that are energetic dominate the fuelwood business. The result is in agreement with the finding of Maurice *et al.* (2015) who reported that the age distribution of the household heads was within the bracket of 20 – 40 years.

The results also revealed that, 67.5% of the respondents were married, this could be attributed to the expectations that married people are more responsible when compared to

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their unmarried counterpart and as a result of this, any opportunity to obtain financial assistance that is needed to sustain their business, married people tend to be favorably considered when compared to the unmarried ones. This result was in agreement with the findings of Eniola and Odebode (2022) who reported that 92.0% of fuelwood marketers were married.

Table 2: Socio-Economic Characteristics of Fuelwood Marketers (N=120)

Factor	Frequency	Percent
Gender		
Male	8	6.7
Female	112	93.3
Age		
21-30	28	23.3
31-40	44	36.7
41-50	32	26.7
51-60	10	8.3
60 and above	6	5.0
Marital status		
Married	81	67.5
Single	20	16.7
Divorce	12	10.0
Widow/widower	7	5.8
Household size		
1-5	18	15.0
6-10	31	25.8
11-15	37	30.8
16-20	20	16.7
21 and above	14	11.7
Education		
Quranic	74	61.7
Primary	25	20.8
Secondary	17	14.2
Tertiary	1	0.8
No Basic Education	3	2.5
Primary Occupation		
Farming	18	15.0
Fishing	9	7.5
Fuelwood business	72	60.0
Trading	9	7.5
Others	12	10.0
Years of experience		
1-7	22	18.3
8-14	34	28.3
15-21	38	31.7
22-28	16	13.3
29 and above	10	8.3
Total	100	100.0

According to the findings, 30.8% of the respondents had household size of between 11-15 persons, while 11.7% of fuelwood marketers had household size with more than 21 persons. This revealed that respondents with large, medium and small household size were found in the marketing of fuelwood in the study area. The implication here is that marketers with larger family size had opportunity of using more of family labour than hired labour. This finding is in line with Ariyo (2019), who reported that, respondents had the household members of 11-15 persons (11.7%) in his research, 'Determinants of fuelwood marketing in Igabi local government area of Kaduna state, Nigeria'. Although, the large household size of 11-15 in this study has disagreed with the findings of Jacob *et al.* (2017) who observed that 53% with 1-5 household size in their research, 'Economic analysis of firewood marketing in Uyo Capital City, Akwa Ibom State'.

Majority of the respondents had Quranic education (61.7%), only 2.5% had non-formal education in the study area. The implication of this is that it would be difficult for them to adopt modern techniques, innovation or new ideas in their business. This do not agree to the findings of Jacob *et al.* (2017) who stated that, 93.0% of their respondents were literate and that of Enete *et al.* (2011) who reported that the respondents that are educated are likely to respond much more positively to trade than those who do not have opportunity to any formal education. The result does not also agree with the findings of Bashir *et al.*, (2021), who reported that farmers that are literate have greater advantages over those that are non-literate; hence this made them to be more receptive to change and innovation that will help them to increase their productivity and income generation.

The results also indicate that 60% of the respondents had fuelwood business as their main occupation. The implication is that during the rainy season the labour force is diverted to farming activities and this will affect their fuelwood business. Especially for women who are participating in family farming activities for the production of food during the rainy season.

The result indicates that, 31.7% of the respondents had an experience of 15-21 years, while 8.3% had an experience of above 29 years in the business fuelwood. Experience matters a lot in any business enterprise, this implies that, the higher the marketing experience, the better the chances of having more gains or profits, benefits and returns from the business. This is because a marketer with higher marketing experience would have mastered the positives and negatives of the business and would have known how to face all the challenges in the fuelwood business. The result is in agreement to the findings of Azeez *et al.* (2014) who revealed in their findings that year of the experience in fuelwood business was one of the factors that determine the profitability of fuelwood business enterprise.

Marketing Channels of Fuelwood

Marketing channels are significant in analyzing the marketing system because they show how the various actors in the marketing system are organised to convey items or commodities from the producer to the end user. The marketing channel is the journey that a commodity takes from the point of production to the final consumer (Olukosi and Isitor, 2005).

Figure 1 showed how fuelwood marketers obtain their products (fuelwood), 63.3% of the respondents obtain their fuelwood from the forest due to some reason such as cheaper price thereby purchasing the bulk of fuelwood from the forest. Sourcing of fuelwood from the wholesaler represents 10.0% and often supplies them on credits. Due to these services

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offered by the wholesaler, the fuelwood marketers tend to overcome few challenges on sourcing their fuelwood. The results were in line with the findings of (Olajuyigbe *et al.*, 2020) who reported that, the marketing of NTFPs is specialize; involving producer (gatherer), wholesalers' trader in rural, regional and urban areas and retail traders, while most people and especially farmers, participates in these activities seasonally or on part time basis.

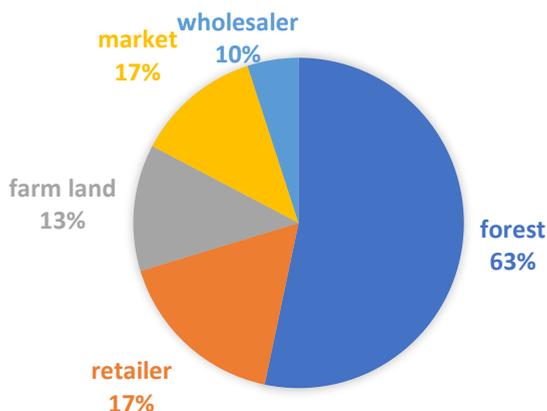


Figure 1: Distribution of respondents based on sourcing their fuelwood.

Figure 2 showed that majority (57.5%) of the respondents do not belong to the association of fuelwood marketers, while 42.5% were members of the association and this gives them added advantage such as obtaining fuelwood at cheaper price, reduced transportation cost, access to loan when the need arises. This will also aid professional development and disseminating of useful information within the association. This finding was in line with the findings of Jacob *et al.* (2017) who reported 63% of the traders belonged to the association of firewood marketers in Uyo capital city, Akwa, Ibom state'.

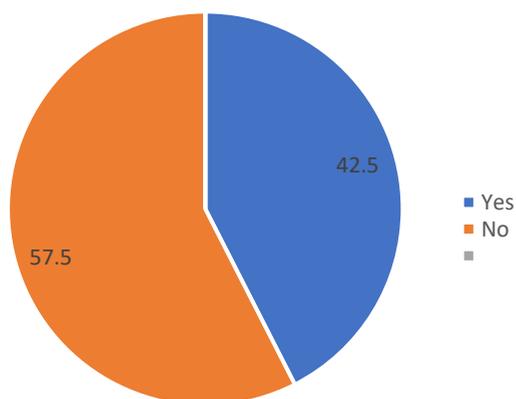


Figure 2: Involvement in the association of fuelwood marketers

Table 3 showed that, majority (65.8%) of the fuelwood marketers represents small scale business type, while 4.2% had a large-scale business type. Those with the small-scale business could be attributed to low capital in the marketing of fuelwood in the area. The results also revealed that 54.2% of the respondents affirmed that fuelwood marketing is a good business to be carried out in terms of income generation in the area.

Table 3: Business scales and perception of the business

Variables	Frequency	Percent
Business Scale		
Small Scale	79	65.8
Medium Scale	36	30.0
Large Scale	5	4.2
Perception of Fuelwood Business		
Good	65	54.2
Fair	50	41.7
Bad	1	0.8
Others	4	3.3
TOTAL	120	100.0

Table 4 indicates that, 27.5% earned between ₦2,100 - ₦3,000, while 10% of the respondents earned ₦4,100 and above in fuelwood business. This implied a very good contribution of the business to household economy as the marketing activities are concentrated during both seasons, although, much is done in the dry season when the farming activities are less or over thereby reducing poverty among the people in the area.

Table 4: Daily income generation by the respondents

Daily income (₦)	Frequency	Percent
100-1000	26	21.7
1100-2000	30	25.0
2100-3000	33	27.5
3100-4000	19	15.8
4100 and above	12	10.0
Total	120	100.0

The average-cost method is useful to businesses for several reasons. It assigns value to the cost of goods sold (COGS) by using the weighted average of the entire inventory that the company purchased during a period of time. Average Rate of Return is a financial metric used to measure the profit or loss of an investment over a specified period, expressed as a percentage of the initial investment cost (Berrada, 2022). The findings in Table 5 indicated that, labour and cutlass (41.9% and 56.8%) among the variable and fixed cost items (₦12,500.00 and ₦9,450.00) had the highest contribution in fuelwood business. The results also revealed that, other expenditures (₦5,800.00) had contributed (19.5%) least to the marketing of the fuelwood business. The total cost (TC) incurred in the business was ₦46,450.00, the total revenue indicated ₦89,250.00 while the net profit earned in the marketing was ₦42,800.00 per week. This finding was agreed with that of Olugbire *et al.* (2016) who reported that, marketing of fuelwood was very profitable with an average fuelwood marketer earning ₦6,558.18 as gross margin per week in their research,

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“Contribution of fuelwood marketing to sustainable livelihood in Oyo state” and that of Jacob *et al.* (2017), who observed that firewood marketers earned a profit of ₦7075.77 in their research, ‘Economic analysis of firewood marketing in Uyo Capital City, Akwa Ibom State’. The results also revealed that, return on investment (ROI) represents 47.96% indicating that, fuelwood business is a profitable venture. For this, marketing of NTFPs have great potentials for increasing the income and improving the lives of people in Bida Local Government Area.

Table 5: Average cost and return of fuelwood marketers per week

	Cost Items	Amounts (₦)	Percent
A	Variable Cost (VC)		
	Cost of labour	12,500	41.9
	Cost of transportation	11,500	38.6
	Other expenditure	5,800	19.5
B	Total Variable Cost (TVC)	29,800.00	100
			64.2
C	Fixed Cost (FC)		
	Axe	7,200	43.2
	Cutlass	9,450	56.8
	Total Fixed Cost (TFC)	16,650	100
	Total Cost (TVC+TFC)	46,450	35.8
			100
D	Total Revenue (TR)	89,250	
E	Gross Profit Margin (GM=TR -- TC)	42,800	
F	Return On Investment (ROI=Profit/TR X 100)	47.96%	

The results revealed cost of labour (42.0%) as the most important constraint in the fuelwood business. This could be attributed to difficulties involving in the process of cutting the trees or branches before making it readily available for the marketers. Secondly, transportation recorded 24.7% among the constraints encountered in the marketing of fuelwood. This implied that, the bulk of fuelwood is from the forest and many roads in the study area were in the state of disrepair with lots of potholes, while the least percentage was recorded in lack of capital and price fluctuation with 22.8% as well as 10.5% respectively. Lack of capital could be due to lack of financial institutions that would aid in granting loan to the fuelwood marketers in the area. This finding is in line with the findings of Ariyo (2019) who reported that, transportation and lack of capital (33.3% and 25.0%) as the major constraints to fuelwood marketing in Igabi local government area of Kaduna state.

Table 6: Constraints encountered in the marketing of fuelwood

Category	*Frequency	Percent
Cost of Labour	68	42.0
Lack of capital	37	22.8
Transportation	40	24.7
Price fluctuation	17	10.5
Total	162	100.0

*Multiple responses

CONCLUSION

From the findings of the study, it can be concluded that, women are major actors in fuelwood marketing in the area, age between 31- 40 years, mostly married with household size of 11-15 members. Majority had Quranic education with 15 - 21 years of marketing experience. The research showed that, fuelwood business is profitable with 47.96% return on investment, although, labour, transportation cost and lack of capital are the major constraints in fuelwood business. It can be concluded that fuelwood marketing in Bida local government area is a profitable venture.

Based on the results obtained from this research, the following recommendations were made:

For the successful and continuous supply of fuelwood on a sustained basis, there is need for artificial regeneration of fuelwood tree species in the reserved forest areas that were exploited, development of woodlots and forest plantation; this will help to solve the problem of inadequate supply of fuelwood.

Government should try and provide alternative sources to reduce the detrimental effect to environment associated with fuelwood marketing, also afforestation should be emphasized.

Proper harvesting techniques such as cutting of trees with a power saw at stump height should be emphasized to enable the trees regenerate. Fuelwood marketers should be provided with soft loans easily accessible to address the challenge faced by lack of capital

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