

MARKETING ANALYSIS OF FIREWOOD AND CHARCOAL AS ENERGY SOURCES IN KANO METROPOLIS



¹ Abubakar, A., * ¹ Umar, M., ¹ Inuwa, A., ¹ Garko, M. B. A.,
¹ Dantani, A. ¹ Kwa, I. N. ² Gupa, M. A. and ³ Tijjani, U. B.

¹Department of Forestry and Wildlife Management, Bayero University, Kano

²Department of Forestry, and Wildlife, University of Maiduguri.

²Department of Forestry, and Wildlife Management, Modibo Adama University of Technology, Yola

²Department of Forestry and Wood Technology, Federal University of Technology, Akure

Corresponding author: adamuabubakar3040@gmail.com.

Abstract

The study examined the marketing efficiency of firewood and charcoal as energy sources in Kano metropolis. Data was collected from 63 respondents and analyzed using descriptive statistics, the marketing margin tool and marketing efficiency tool. The respondents were mostly (100%) males with 50% having quranic education. More than 90% of the firewood respondents are married and 70% of the charcoal marketers are married as well. The study identified marketing channels which composed of the assemblers, wholesalers, itinerant vendors, retailers and consumers. Constraints associated with firewood and charcoal marketing were identified. The main problem of the respondents is inadequate of capital (34.4%), other problems affecting respondents are transportation cost (31%), storage (17.6%) and price instability (17%). It was recommended that government should try and provide alternative affordable energy so as to reduce the detrimental effect to environment, also afforestation should be encouraged. Also strong cooperative organization among marketers should be established for efficient and standardize the price of the commodity within the study area

Keyword: Fuel wood, afforestation, biomass, market efficiency,

Introduction

Fuelwood plays a significant role in energy requirement in many countries particularly the developing countries; where there is an increasing dependence due to population growth and limited access to modern alternative fuels. According to the World Energy Council (2004), fuel wood contribute to more than 70% traditional energy consumption in the developing country. For instance, more than 50% of global charcoal production is consumed in Africa of which Nigeria consumes about 16% (Munalula and Meincken, 2009), majority of this charcoal is consumed by households for cooking and heating. The availability, reliability of supply and cheaper prices renders the fuelwood more preferable than alternative sources of energy (Ogunsanwo and Ajala, 2002). Furthermore due to the anticipated steady increase in population, it is expected that actual consumption of firewood and charcoal will continue to rise to a greater extent. This will put stress on natural forests from where the firewood and charcoal are obtained, possibly resulting in degradation of the forest ecosystems.

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 (Kalu *et al.*, 2009). More wood and charcoal are used when kerosene or liquid gas become scarce; the cost of gas and the long queues for kerosene force users to turn to the more readily available fuel source (Ogunsanwo *et al.*, 2014). Most urban firewood and charcoal users buy fuel from retailers and small number collect their own fuel wood. Purchases are made mostly within Kano Metropolis, but small proportion buy firewood and charcoal outside. Users buy from the nearest retailers to them; or directly from central fuel wood or charcoal depots. There is no standard price of fuel wood and charcoal presently in Kano metropolitan; fuel wood sold at N300 to N200 ranging from large to small bundle, charcoal sold at N2000 to N100 ranging from large bags to small nylon bag, depending on the quality and quantity of the fuel. For a mega city of Kano where mean monthly consumption of energy product is more than 300kg lack of adequate data available on the amount of fuelwood sold within Kano could posed important challenge for the livelihood of the traders, the inhabitants and policymakers. Thus, the aim of the study was to examine the marketing efficiency of energy related source (firewood and charcoal) in Kano metropolis.

Methodology

Study Area

The study area consists of 8 local government areas namely; Dala, Kano municipal, Fagge, Gwale, Nassarawa, Kumbotso, Ungoggo and Tarauni. Kano state is situated in the Sudan savannah Agro-ecological zone of Nigeria having coordinates of 9°33' to 12°37'N longitude and 7° 34'W and 9° 29'E latitude and is made up of 44 local

governments. The state has a population of 12million people (NPC, 2006). The vegetation of the area is Sudan savannah types which consist of a few scattered shrubs and grasses cover about 30 to 40m above the ground. The trees consist of *Adonsoniadigitata* (baobao), acacia, *Azadiractaindica*, (neem), *Temarandusindica*, etc.

Method of Data Collection

The primary data was obtained from the respondents by the use of structured questionnaire designed for the objectives of the study. Multi-stage sampling technique was used for the purpose of this research. In the first stage, Two (2) markets and Six (6) selling points were purposely selected across Kano metropolis in relation to their importance in firewood and charcoal marketing. The markets are Mariri in Kumbotso LGA and KofarWambai in Kano Municipal, and the selling points are Rijiyarlemo, Kurna and kofarRuwa in Dala LGA, Dorayi in Gwale LGA, France Road in Fagge LGA and Brigade Yan tsire in Nassarawa LGA. In the second stage, twenty five (25) respondents were considered at random from the Mariri Market (Kumbotso); fifteen (15) respondents were considered at random in Kofarwambai (Kano Municipal); two (2) respondents were purposely selected in Rijiyarlemo (Dala); Five (5) respondents were considered at random in Kurna (Dala); Three (3) respondents were selected in KofarRuwa (Dala). Seven (7) respondents were selected from Dorayi (Gwale); Four (4) respondents were selected from France Road (Fagge); and Two (2) respondents were selected Brigade (Nassarawa). Thus give 63 respondents as sample size for this research. The analytical tools used in this study were descriptive statistics which include Tables, frequency count and percentages.

Marketing Margin Analysis

Marketing margin is the difference in prices paid for a commodity at different stages of marketing system. Hence, marketing margin represents differences in price of a given commodity at different stages of time, place, form and possession as the commodity passes from producer to final consumer. Purchase price is the quantity of payment offered by a buyer of good or service. It is offered in naira per quantity.

Mathematically,

Mathematically, $GMM = Sp - Pp$

Where: GMM= Gross marketing margin (N); Sp= selling price (N); Pp= purchase price (N);

Net Marketing Margin (N)

NMM= Net margin

TMC= Total marketing cost

$\%NMM = \frac{GMM - TMC}{GMM} \times 100$

Market Efficiency

Marketing efficiency is often used to measure market performance. Marketing efficiency is defined as the maximization of the ratio of output to input in marketing. Marketing inputs include resources necessary to perform the marketing function such as labour, packaging, e.t.c and marketing output includes time, form, place and possession utilities that provide satisfaction to consumers.

Mathematically,

$$\text{Marketing efficiency} = \frac{\text{value added through marketing}}{\text{cost of marketing}} \times 100$$

$$= \frac{\text{selling price} - \text{purchase price}}{\text{cost of marketing}} \times 100$$

Decision Rule,

ATR/ATC > 100, is efficient,

ATR/ATC < 100, inefficient

ATR/ATC = 100, optimal

Where,

ATR= Average Total Revenue and it is the total amount of Naira (N) obtained by selling of fuel wood and charcoal.

ATC= Average Total cost and it is the total cost incurred in Naira (N) over the marketing of the fuel wood and charcoal

Results and Discussion

Socio-economic Characteristics of the Firewood and Charcoal Respondents

The results of the socio-economic characteristics of the respondents' i.e. age, gender, educational status, marital status, household size, and business experience in the study area are presented in the table below;

Table 1: Socio-economic Characteristics of Firewood and Charcoal Marketers

Variable	Wholesalers		Retailers	
	Frequency	Percentages	Frequency	Percentages
Firewood marketers				
Gender				
Male	19	100	21	100
Female	0	0	0	0
Total	19	100	21	100
Marital Status				
Married	6	75	11	61.9
Single	2	25	4	38.1
Total	8	100	14	100
Educational Status				
Quran	9	47.3	1	4.7
Primary	5	26.3	8	38.1
Secondary	4	21.1	6	28.6
Tertiary	1	5.3	6	28.6
Total	19	47.3	21	100
Charcoal marketers				
Variable	Frequency	Percentages	Frequency	Percentages
Gender				
Male	8	100	15	100
Female	0	0	0	0
Total	8	100	15	100
Marital Status				
Married	6	75	11	73.3
Single	2	25	4	26.7
Total	8	100	15	100
Educational Status				
Quran	3	37.5	5	33.4
Primary	4	50	8	53.3
Secondary	1	12.5	2	13.3
Tertiary	0	0	0	0
Total	8	100	15	100

Source: Field survey, 2019

Sex Distribution of the Respondents

The results from table 1 showed that 100 per cent of the respondents were males which mean that firewood and charcoal marketing is a male dominated activity. This is common occurrence in northern Nigeria especially were this research is conducted that majority females are not engaged in outside activities due to religious and traditional believes. Literature is full with the male domination in labour demanding livelihood activities (Kwaghe, 1999; Ani, 2004) all reported that males dominate firewood and charcoal marketing as well as other agricultural activities that are labour demanding.

Marital Status of the Respondents

The results in table 1 also revealed that majority of the respondents were married. 75% and 73.3% of charcoal wholesalers and retailers are married respectively, while 38.1% charcoal wholesalers and 26.7% of retailers are single. Similarly, 75% and 61.9% of the firewood wholesalers and retailers are married respectively, 25% of the firewood wholesalers and 38.1% of the retailers are single. This is in line with the findings of Taphone (2009) who reported that married people have more responsibility such as provision of foods, education and health and well-being of their children and spouses. This may be the reason why the business is dominated by married people.

Distribution of Respondents According to Educational Level

The result also showed low level of formal education among the respondent as the highest level of formal education observed in both wholesalers and retailers of firewood and charcoal is primary school (Table 1). This is in line with findings of The Amaza (2000), who stated a prevalence of non-formal educated in high labour demanding livelihood labour.

Table 2: Distribution of Respondents According to Species Preference

Fuel wood	Wholesalers		Retailers	
	Frequency	Percentage	Frequency	Percentages
<i>Anogeissusleiocarpus</i> (Marke)	12	63.2	14	66.7
<i>Diospyrosmeslifomis</i> (Kanya)	2	10.5	3	14.5
<i>Terminaliasuperba</i> (Baushe)	1	1	5.3	1
<i>Vitellariaparadoxa</i> (Kadanya)	3	3	15.7	1
<i>Isobelinadoka</i> (Doka)	1	5.3	1	4.7
<i>Ptrocarpuserinaceus</i> (Madobiya)	0	0	1	4.7
Total	19	100	21	100

Source: Field survey, 2019

From table 2, it was observed that more than 60% of both the respondents purchase *Anogeissusleiocarpus* (Marke) as it is the most preferred by the consumers. *Diospyrosmeslifomis*(Kanya) was preferred by 10.5 and 14.5% of the wholesalers and retailers respectively less than 6% buy either Doka or Madobiya. The reason for the preference of Market over other trees species is that, it burns slowly and gives a good by-product in form of charcoal. Marketing channel as defined by Olukosiet al. (2007), as the path a product follows as it moves from the producer through various agencies involved the marketing to the ultimate user. This is in accordance with findings of Adegeye and Dittoh (1985), marketing channels, is the sequence of intermediaries or middlemen, and markets through which produce pass en route from producers to final consumers.

Table 3: Marketing margin of Charcoal and Firewood (N/Truck)

Variable	Wholesalers		Retailers	
		TMC%		TMC%
Marketing margin of charcoal (N/truck)				
Selling price	250,000		39,000	
Purchase price	160,000		25,000	
Transportation	26,500	51.5	1400	28.3
Labour	5500	10.7		42.4
Bag	4000	11.7		2.0
Middle Mean	3000	5.8		6.1
Loading	5000	9.7		10.1
Uploading	4000	7.8		6.1
Revenues	1500	2.9	250	5.1
TMC	51,500		4950	
Gmc =SpSp	90,000		14000	
Nmm =Gmm –TMC	38,500		9050	
%NMM	42.8		64.6	
Marketing margin of Firewood (N/truck)				
Variable		TMC%		TMC%
Selling price	92000		23000	
Purchase price	34,000		9500	
Transportation	29,000	64.6	800	16.33
Labour	4000	10.02	1300	26.5
Rope	900	2.0	1400	28.6
Middle Mean	1500	3.3	500	10.2
Loading	5000	11.1	600	12.2
Uploading	3500	7.8	200	4.08
Revenues	2500	1.1	100	2.04
TMC	44		4900	

Source: Field survey, 2019. TMC: Total marketing cost; GMM: Gross marketing margin; Sp: selling price; Pp: purchasing price NMM: Net marketing margin

The marketing margin for the firewood wholesalers is 22.6% and 63.7% for the retailers. The marketing margin for the charcoal wholesalers is 42.8% and 64.6% for the retailers. This means that the lower the marketing margin the higher the turnover rate and therefore the higher the profit. From the table above, both the wholesalers and retailers have profit. Also marketing efficiency of fuel wood in the study area is 129% for the wholesalers and 276% for the retailers. For a market to be efficient, it must have a percentage greater than 100, this shows that the fuel wood market is efficient but efficiency of the retailers is higher than for the wholesalers.

Table 4: Distribution of Respondents According to the Problems Encountered in Marketing of Firewood and Charcoal in the Study Area

Constraints	Wholesalers		Retailers	
	Frequency	Percentage	Frequency	Percentage
Transportation	4	14.8	6	16.6
Product sourcing	5	18.5	5	13.9
Market information	4	14.8	2	5.6
Inadequate capital				
Storage	9	33.4	14	38.8
Price instability	1	3.7	5	13.9
Cost of levy	3	11.1	2	5.6
	1	3.7	2	5.6
Total	27	100	36	100

Source: Field survey, 2019

Result from table 4 above showed 16.7% of the respondents are faced with the problem of price fluctuation, while 72% of them encounter the problem of inadequate trade capital. The most prominent problem of both the firewood and charcoal marketing is inadequate capital (72%), which is an important constraint as this problem does not give room for expansion even if the other problems were solved. Transportation is also a problem encountered by both the firewood and charcoal marketers (wholesalers 14.8% and retailers 16.6%); this was due to poor access to road from places where they purchase the product especially during raining season because most of the areas do not have a good road network which consequently increase the cost of transportation. Both the respondents encountered storage problem, (17.6%) as the firewood and charcoal are usually stockpiled outside in an open land which give room for stealing. Price instability is also observed by the respondents for both wholesalers and retailers (11.1% and 5.6% respectively).

Conclusion

It can be concluded that firewood and charcoal marketing in Kano metropolis is profitable and efficient despite the problems associated with it. The marketing channel was also found to be efficient including number of players such as rural assemblers, wholesalers, retailers, itinerant vendors and middlemen.

Recommendations

It was recommended that government should try and provide alternative energy sources so as to reduce the detrimental effect to environment associated with firewood and charcoal marketing, also afforestation should be encouraged. Marketers should be provided with loan scheme that will be easily accessible as this will address the problem of inadequate capital, also government should improve the transportation system to ensure timely conveyance of produce and to reduce cost of transportation. Also strong cooperative organization among marketers should be established for efficient and standardize the price of the commodity within the study area.

Reference

- Adeyege, A.J. Ditttoh, J.S (1985). Essentials of Agricultural Economics. Impact Publishers, Ibadan Nigeria. Pp 183-195.
- Amaza, P.S (2000) Resources Used Efficiency in Crop Production in Gombe State Nigeria. Un Published Phd thesis, Department of Agricultural Economics, University of Ibadan, Nigeria.
- Ani, A.O (2004) Women in Agriculture and Rural Development. First Edition, Priscuila Publishers
- Kalu, C., Modugu, W. W. and Ubochi, I. (2009). Evaluation of solid waste management policy in Benin metropolis, Edo State, Nigeria. *African Scientist*. 10 (1): 1-7.
- Kwaghe, P.V (1999). Women Feed the World: Prospect Problems and Solutions for Sustainable Agricultural Development: Principles and cases Studies in Nigeria. Edited by U.C Undiandeye, Y. Bila and S. Kushawaha. Mainasara Publishers Maiduguri, Nigeria., 157 Pp.
- Munalula F. and M. Meincken, (2009). An evaluation of South African Fuelwood with Regards to Calorific Value and Environmental Impact. *Biomass and Bioenergy* 33: 415 - 420
- Ogunsanwo, O. Y., Attah, V. I., Adenaiya, O., and Umar, M (2014). Sustainable Utilization of Firewood as a Form of Energy in Nigeria. In L. Popoola, O.Y. Ogunsanwo, A.O. Akinwale, I.O. Azeez, V.A.J. Adekunle, N.A. Adewole (Eds.) Proceedings from 37th Forestry Association of Nigeria Annual Conference at Minna, Niger State. Vol.1 Pp 816-830.
- Ogunsanwo, O. Y., Ajala, O.O. and Sanusi, M.A. (2003). *Gliricidiasepium* (Jacq.) Steud: A Potential Species for Community Woodlot Development in Nigeria. In: Akindele, S.O and Popoola, L. (Eds), Community Forestry and Stakeholders' Participation in Sustainable Development. Proceedings of the 29th Annual

- Conference of the Forestry Association of Nigeria held in Calabar, Cross River State, Nigeria. 6th – 11th October, 2003. Pp 309-314.
- Olukosi, J. A. and Isitor, S. U. (2007) and (2010). Introduction to Agricultural Marketing and Price, Principle and application. Living book series, G. U Publication Abuja FCT, Nigeria.
- Taphone, B. G (2009). Resources Productivity and Efficiency of Groundnut Farming: In Northern part of Traba State, Nigeria. Msc. Thesis deoartment of Agricultural Economics and Extension, Yola, Adamawa State. Pp 456
- World Energy Council (WEC 2004): Survey of World Energy Resources. <http://www.worldenergy.org/wec/eis/publications/reports/ser/biomass/biomass.asp> 11/12/2011