

Fuelwood Utilization and Marketing in Kogi State

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Abstract

This study focused on fuelwood utilization and marketing in Kogi State. A survey of rural and urban households was carried out in Kogi State. The aim was to generate the necessary data that would form the bases for putting in place an energy policy most appropriate for the state. Data were generated through the use of questionnaires and interview schedules. Findings show that the fuelwood still represent the predominant domestic energy in use in the state as indicated by 56.7% of the respondent followed closely by kerosene as indicated by 40.8% of the correspondent. Major reason adduced for its common usage include its ready availability, (41.7%), ease of use (23.3%) and relatively cheapness (20.0%) of respondent respectively in comparison to other energy sources. The result however showed that even though majority of the respondent (54.2%) still obtain their fuelwood needs free, a significant number (39.0%) now have to purchase their fuelwood needs, an indication of their increasing scarcity in Kogi State. Its increasing scarcity is further manifested by the finding that the majority of those involved in its collection (house helps, mothers and their children as reveal in the study) now have to travel long distances (an average of 2km) to obtain supplies and these activities are mostly performed twice weekly. It is recommended that government should put in place an appropriate energy policy that would ensure continued availability of fuelwood in the state.

Keywords: Fuelwood, Utilization, Marketing And Sustainable Development

Introduction

Fuelwood is a biological derived energy that have remained the major sources for heating and cooking throughout the whole developing economies. According to FAO (1985a), approximately 2000million people in the world over mostly rural people and the urban depend on wood fuel as their main or sole source of energy to cook their food and keep warm, while nine tenth of all the world taken annually from tropical forests alone, little more than 2000million cubic meters (M³) is used for purpose other than fuel (FAO 1985b). In Africa in particular, fuelwood remains the largest energy source in both rural and urban areas with over 90% of the people depend on either firewood or charcoal for cooking. According to WWF (1993) these biologically produced energy sources not only meet the needs of African households but also fuel schools, hospital, restaurants, bakeries (brick kilns) and many commercial and small industrial activities. With regard to Nigeria, fuelwood is the most important forest product. This is because wood in the form of of fuelwood and charcoal is by far the dominant fuel used by the majority of Nigerians for cooking, heating and other domestic work, current annual fuelwood estimated consumption in Nigeria stands at 70million m³ (papka, 1997) accounting for well over 90% of the total annual wood production in the country. (NEST, 1991).

Thus, considering the high dependency ratio of the people on this energy source, its place in the nutritional, cultural, sociological, economic, environmental and political life of the people cannot be said to be undermined. Its availability or otherwise will define the pace of development as well as the wellbeing of the people. The availability, prices and usage and marketing of fuelwood should therefore not be left to the vagaries of weather or to be determined solely by the forces of supply and demand, rather there should be a deliberate government intervention to influence their availability, prices and use. Any energy policy put in place in that direction would however not achieve desired result if it is not based on data reflecting the existing situation on ground. It was in a bid to generate such information that the research was initiated.

The Food and Agricultural Organization, FAO, (1998) observed that the challenge of bridging the gap between demand and supply of about 6 million tons per year led to the depletion of forests and consequent loss of soil fertility. In the absence of forests, flooding from rainstorms led to serious damage to material objects, as well as human casualties. FAO's "Scenario Analysis" on Nigeria (2005), observed that in Nigeria, "The land and environment is very highly devastated by climate, farming, fires, erosion and population pressures." The report further projected that by 2020, "oil is deemphasized and the demand for renewable natural resources including wood and non-wood forest products is on the increase." In addition, Nwafor (2006) asserts that during the period from 1981-1990, the rate of deforestation in Nigeria was 0.7 percent, and Okafor (1990) indicates that this rate was further exacerbated by the fuelwood extraction rate, approximately 3.85 times the rate of re-growth and almost 10 times the rate of regeneration. Empirical evidence indicates that this unfortunate scenario persists across the forest reserves of Nigeria located in Kogi, and five other states (Ayotebi, 2000). The findings of the African Institute of Applied Economics, (2005) demonstrate that real fuelwood prices in various parts of the country were doubling in the last two decades. Despite the uncertainty as to what could be responsible for such a harsh environmental scenario, Botkin & Keller (1997) and Cooke, Köhlin & Hyde (2008) stress that an

economic analysis can help us understand why and how environmental resources of forests are being utilized and conserved.

Even though a holistic understanding of the economic systems that perpetuate consumption of fuelwood and lead to deforestation will provide better evidence for policy makers interested in addressing efficient energy use and abatement of deforestation in Nigeria, unfortunately, the available works on fuelwood economics in Nigeria (e.g. Ebe, 2006; Yusuf, 2006; Cooke et al., 2008) do not use the most appropriate and reliable econometric models to capture the complex nature of the fuelwood crisis.

Utilization of fuelwood creates market failure. The market does not value naturally occurring resources, or “natural capital”, in the production process. These are known as *externalities* and have value as the biosphere's *environmental protection functions*, despite absence of produced goods or clearly defined ownership. As a consequence, they are regarded as free goods.

Cost of fuelwood and other commodities are primarily determined by the prices of inputs including time, labor, capital and technological advances (Samuelson & Nordhaus, 2005). Economic theory relates that an array of factors influence how much will be demanded of any given commodity at any given price: average levels of income, the size of the population (e.g household size), the prices of and availability of related goods (in this case, kerosene, cooking gas and coal), individual and social tastes, special influences (e.g. distance of household to common forests and region), and season (Samuelson & Nordhaus, 2005; Reddy, Ram, Sastry & Devi, 2008). Thus household size can affect fuelwood consumption and scarcity.

A rise in price of a commodity (fuelwood) therefore signals to suppliers (fuelwood producers) that the product is desirable by consumers and is scarce (Samuelson, 1981). Hence, they will allocate more resources (labor, time, technology and capital) to cutting down trees, leading to deforestation and increase in quantity of fuelwood supplied in the area.

Material and Methods

Kogi State lies between longitudes 5°40'E and 7°49'E, and latitudes 6°33'N and 8°44'N. It is bounded to the South by Anambra and Edo States and to the North by Niger, Nassarawa and Federal Capital Territory; to the East by Benue and Enugu States. On the Western flank it shares a common border with Ondo, Ekiti and Kwara States (Kogi A.D. P, 1993). In the 2006 population census, the state pooled a population of 3,278,487, representing 2.34% of the Nigerian population.

The state has a tropical climate with two distinct seasons in a year. Rainy and dry season. The rainy season covers a period of about seven months, April to October, while the dry season lasts for about four months – November to March. The mean annual temperature ranges between 26 and 28°C. The relative humidity during the year varies with the season with the highest of between 80 and 90 % occurring during the dry season especially during the dry harmattan wind.

The vegetation is of low land rainforest type. The forest is presently secondary forest tending toward derived savannah because of population pressure and repeated annual burning. Agriculture is the major occupation of the people of Kogi State and staple crops include yam, cassava, rice, maize and cocoyam while oil palm, cocoa and rubber are the main cash crops.

Kogi state consists of 21 Local Government Areas and based on the sample frame of 30%, three Local Government Areas were selected from Kogi West namely Ankpa Dekina and Ofu. Local Government Area. The main instruments used for data collection were structured questionnaires and interview schedules. A total of 180 questionnaires were distributed on equal bases among the Local Government Areas involved in the study i.e. 30 questionnaire per local government. However, only 120 questionnaires were eventually retrieved from the respondents representing 68% retrieval rates. The data collected were organized into tables and subjected to analysis using descriptive statistic (simple percentages, mean and frequencies).

Results

The result shows that the majority of the respondents (74.2%) fall within the age range of 21 to 50 years while their average age was found to be 34 years. With regard to their sexes, whereas 61.7% were males, females constituted 38.3%. As regard family sizes, the average family sizes were found to be 6 persons per household. In terms of their occupation, whereas 48.3% were civil servants, 51.7% were self-employed persons while illiteracy leveled showed that 44.2% attained tertiary education, 38.3% secondary education and 12.5% primary education with only 5% without any formal education (Table 1).

Table 1: Personal Profile of the Respondents

S/N	Age	Frequency	%	X	FX	Mean
A	Less than 20 yrs	18	15.0	10	180	
B	21 – 30 yrs	30	25.0	25.5	765	
C	31 – 40 yrs	28	23.4	35.5	994	
D	41 – 50 yrs	31	25.8	45.5	1410.5	
E	51 yrs & above	13	10.8	55.5	721.2	
	Total	120	100		4071	33.92
Sex						
A	Male	74	61.7			
B	Female	46	38.3			
	Total	120				
Family size						
A	1 – 3 persons	18	15.0	2	36	
B	4 – 6 persons	59	49.2	5	295	
C	7 – persons	27	22.5	8	216	
D	10 – 12 persons	13	10.8	11	143	
E	> 12 persons	3	2.5	13	39	
	Total	120	100.0	39	729	6.075
Occupation						
A	Civil servants	58	48.3			
B	Self employed	62	51.7			
	Total	120	100.0			
Education attainment						
A	No formal education	16	5.0			
B	Primary education	15	12.5			
C	Secondary education	46	38.3			
D	Tertiary education	53	44.2			
	Total	12	100			

Most commonly and frequently used energy sources in Kogi State and reasons for such common usage.

The result shows that fuelwood represents the most commonly and frequently used energy sources in Kogi State as confirmed by 56.7% of the respondents followed closely by kerosene (40.8%) of the respondents while gas is the least used energy source with only 0.8% of the respondents making use of it (Table 2). The reason cited for their common usage ranged from their ready availability (41.7%) to relative cheapness (20.0%) and ease of use (23.3%) of the respondents (Table 3).

Table 2: Response on commonly and frequently used energy sources in Kogi State.

Energy sources	Frequency	Percentage
Fuelwood	68	56.7
Kerosene	49	40.8
Electricity	2	1.7
Gas	1	0.8
Total	120	100

Table 3: Responses on reasons for common usage as domestic energy source

Reasons	Frequency	Percentage
Ready availability	50	41.7
Ease of use	28	23.3
Relative cheapness	24	20.0
It cook fast	11	9.2
Give better taste to food	7	5.8
Total	120	100.0

The major supply sources for fuelwood in Kogi State.

Majority of the respondent (54.2%) indicated obtaining their own fuelwood supply from their own farm/forest lands, but a reasonable (39.2%) indicated buying theirs from the markets. Only about seven percentage of the respondents indicated obtaining their supply from their own firewood plantations while non obtained theirs from either forest reserve or bush (Table 4).

Table 4: Responses indicating the major supply sources for fuelwood in Kogi State

S/N	Major Supply Sources	Frequency	Percentage
A	From own farm/forest lands	65	54.2
B	Brought from the market	47	39.2
C	From own firewood plantations	8	6.5
D	From forest reserves	-	-
E	From bush land	-	-
Total		120	100

The average amount and the percentage of daily income spent on fuelwood purchase.

The result shows that the majority of the respondents (57.5%) who do buy their fuelwood needs spend between N40 – N60 daily on fuelwood purchase, while 31.9% spend between N10 – N30 on its purchase. The average amount being spent by these groups of respondents on firewood on daily bases was found to be N48.09 (Table 5.)

On percentage bases, majority (80.85%) of these group of respondents indicated spending between 1 – 25% of their daily incomes on fuelwood purchase. The percentage of their daily income being spent of fuelwood purchase was found to be 19.38% (Table 6).

Table 5: Responses regarding the average amount spent daily on fuelwood purchase.

S/N	Average amount spent	Frequency	%	X	FX	Mean
A	N10 – N30	15	20	20	300	
B	N40 – N60	27	57.5	50	1300	
C	N70 – N90	1	2.1	80	80	
D	N100 – N120	1	2.1	110	110	
E	N130 – N150	3	6.4	140	420	
Total		47	100.0	400	2260	48.09

Table 6: Responses regarding the percentage of the Respondent's daily income spent on fuelwood purchase.

S/N	Average amount spent	Frequency	%	X	FX	Mean
A	51 – 25	38	80.85	13	494	
B	26 – 50	6	12.77	38	2228	
C	51 – 75	3	6.38	63	189	
D	76 – 100	-	-	-	-	
Total		47	100.0	114	911	19.38

The frequencies and responsibilities for fuelwood collection

As shown by survey result (Table 7), majority of the respondents (54.2%) claimed that fuelwood collection were undertaken two times in week whereas 16.7% and 20.8% respectively indicated it was either a daily routine or undertaken three times in a week. With regard of the responsibility for firewood collection, 48.3%, 27.5% and 12.5% of the respondents indicated they were undertaken by the children alone, by the house helps alone and by the mothers and their children respectively (Table 8).

Table 7: Responses on the frequency of firewood collection

Frequency of firewood collection	Frequency	Percentage
Daily	20	16.7
Twice weekly	65	54.2
Three times weekly	25	20.8
Four times weekly	10	8.3
Total	120	100

Table 7: Responses on the responsibilities for fuelwood collection

S/N	Responsibility for fuelwood collection	Frequency	percentage
A	Children only	58	48.3
B	House helps	33	27.5
C	Mothers only	14	11.7
D	Mothers and children	15	12.5
E	Fathers only	-	-
Total		120	100.0

Average distance from home to the supply bases and average length of time spent on fuelwood collection

Forty four percent of the respondents as shown by the result (table 9) indicated that the collectors now travel between 1 – 2km to obtain supplies of fuelwood while 25.8% indicated the collectors trek for less than one

kilometers to obtain supplies was found to be 2.2km.

As regarded the average length of time being spent on fuelwood collection, majority of the respondents (89.7) indicated that the collectors were spending between 1 – 2 hours on such assignments. The average number of hours being spent on fuelwood collection were found to be 2 hours (Table 10).

Table 8: Responses regarding the average distance from home to the supply bases

S/N	Average distance	Frequency	%	X	FX	Mean
A	Less than 1km	3	25.8	0.5	15.5	
B	1 – 2km	58	44.2	1.5	79.5	
C	3 – 4km	17	14.2	3.5	59.5	
D	5 – 6km	19	15.8	5.5	104.5	
E	7 – 8km	-	-	-	-	
Total		120	18.5	1.012590	2590	2.2

Table 9: Responses regarding the average time spent on fuelwood collection

Average time spent (in hours)	Frequency	%	X	FX	Mean
Less than 1 hour	2	2.5	0.5	1.0	
1 – 2 hours	61	89.7	1.5	91.5	
2 – 4 hours	5	7.4	3.0	15.0	
4 – 6 hours	-	-	-	-	
Total	68	100	5.0	107.5	1.58

Recommended Solutions to Fuelwood Scarcity

The results shows that 33.3%, 26.4% and 24.5% of the respondents were of the view that provision of alternative domestic energy sources, introduction of fast growing fuelwood species on farmlands, and the development of more fuelwood plantations in that order are the solutions to fuelwood shortages in Kogi State (Table 10).

Table 10: Responses regarding the solution to fuelwood scarcity

Solution to fuelwood scarcity	Frequency	Percentage
Provision of alternative sources of domestic energy	35	33.0
Introduction of fast growing fuelwood species of farmlands	65	54.2
Development of more fuelwood plantations	26	24.5
Provision of feeder roads to fuelwood plantations	17	16.0
Totals	106	100.0

Discussion

The study has shown that fuelwood still remains the most commonly and frequently used domestic energy source in Kogi State as indicated by 56.7% of the respondents followed closely by kerosene as indicated by 40.8% of the respondents. Reasons adduced for its common usage as domestic energy source include ready availability, ease of use and relative cheapness in comparison to other energy sources. According to FAO (1985a), alternative energy sources are either too costly or not available. This aptly describes the state of kerosene, gas and electricity situation in Nigeria. But even when these alternative energy sources are available, their usage requires investment on stoves and related equipment the prices of which are general beyond the reach of the rural and the urban poor.

The study also revealed that even though majority of the respondents (54.2%) still obtain their fuelwood needs free either from their farm or forestlands, a significant percentage (39.0%) now have to purchase their fuelwood needs. Their purchase by a reasonable percentage of the respondents is as indication of the increasing scarcity of the commodity in Kogi State. The increasing scarcity of fuelwood is confirmed by the fact that majority of those involved in fuelwood collection (Mothers, their Children and house helps) now have trek long distances (an average of 2km) in other to obtain supplies and this is most often undertaken two times in a week. Similar trends have been reported in other parts of the world. In Nepal for instance, women and children are said to be mainly involved in fuelwood collection and they do this by trekking more than 3km to obtain supplies while in Bangladesh, fuelwood shortage is said to be so severe that rural women and children spend an average of 3 – 5 hours a day gathering and transporting fuel (FAO and SIDA, undated).

The study also revealed that for those families who do buy their fuelwood needs, a reasonable part of their income (N48.09) is been expended on this item on daily bases and this constitutes about 19.38% of their daily income (Tables 5 and 6). A related study carried out in the highlands of the Republic of Korea revealed that up to 15% of household income is spent on fuelwood purchase while in the poorer parts of the Andean Sierra and the Sahehian zone, it is up to 25% (FAO 1978). Ardayfio (1986) in a fuelwood study carried out in Ghana found that over a year survey period, the proportion of the household budget taken up by fuelwood purchases rose from 1%

to 16.3% in one village. Report by the World Bank (1989) claims that many rural poor already spend a disproportionately high (30% or more) part of their income on fuelwood.

The amount being spent on daily bases on fuelwood purchase when calculated on a monthly and yearly bases shows that each of the affected family households in Kogi State are spending the average of N1,346.52 and N16,158.24 on fuelwood purchase per month and per year respectively.

Conclusion and Recommendation

The study has shown that fuelwood remains the predominant domestic energy in use in Kogi State but this energy source is becoming increasingly scarce in the State resulting in an unnecessary waste of time and labour in its gathering. Its purchase is also taking up substantial part of the household budget hence urgent action need be taken to reverse the trend. To this end, the following recommendations are hereby made.

- i. Government should put in place energy policy that will ensure continued availability of fuelwood. This it can do through the reinvigoration of the tree planting campaign effort of the Federal Government.
- ii. There should be massive establishment of fuelwood plantation in the State.
- iii. Use of incentives to encourage people to establish village woodlots and incorporation of trees on farmlands should be encouraged.
- iv. Research should be undertaken to identify locally available fast growing fuelwood species appropriate for the State.
- v. All obstacles that presently hinder the production and distribution of kerosene and gas in the country should be tackled.

Similar studies need to be carried out in all the six geopolitical zones in the country so as to generate enough data that will enable government at the Federal level put up a common energy appropriate for the entire country.

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