ECONOMICS OF FUEL WOOD MARKETING IN YOLA-SOUTH LOCAL GOVERNMENT AREA OF ADAMAWA STATE

BY

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APPROVAL PAGE

Economics of fuel wood marketing in Yola-South, Adamawa state

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Being a project submitted to the Department of Agricultural Economics and Extension, School of Agriculture and Agricultural Technology, Federal University of Technology, Yola in partial fulfillment of the requirement for the Award of Post Graduate Diploma in Agricultural Economics.

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DEDICATION

I dedicate this work to my parents, Alh. Audu N. Shelleng and Hajiya Amina A. Shelleng.

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ABSTRACT

The study examined the economics of fuel wood marketing in Yola south Local Government Area of Adamawa state. The objectives of the study were to: describe the socio-economic characteristics, marketing channel and to examine the cost and returns and marketing margin associated with fuel wood marketing. Other objectives of the study were to determine the relationship between gross margin, cost variables and some socio-economic characteristics of the respondents and to determine the major problems of fuel wood marketing. Primary data were obtained on hundred marketers who were randomly sampled. Descriptive statistics, budgetary analysis, multiple regression (inferential statistics) were used to analyze the data. Majority (65%) of the respondents were farmers who were mostly married and of the male gender. A greater proportion of them (55%) had no formal education but possessed marketing experience of up to 9 years. Their family sizes ranges from 1-5 persons. The regression analysis revealed that number of bundle sold (X_5), marketing experience (X_6) and primary occupation (X_7) positively influenced fuel wood marketing and were statistically significant at 1% probability level while cost of ropes (X_3) was inversely related to gross margin but statistically significant at 5% probability level. The respondent exhibit positive gross margin of N2132.91 with marketing margin of 28.08%. The major problems faced by marketers included; tax (18.36%), irregular seasonal sales (12.71%), theft of fuel wood at selling points (11.86%) and inadequate credit to finance the business (11.30%) among others. It was recommended that people should be encouraged to use less fuel wood by using fuel wood efficient stove which uses less fuel wood and provide enough energy for cooking. Government should on the other hand ensure adequate supply of kerosene at a much subsidized rate and intensify campaign on the effect of deforestation.

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INTRODUCTION

1.1 Study Background

The word marketing extends beyond dictionary definition and is widely interconnected subject with numerous publications. American Marketing Association (AMA) revisit the definition of marketing every five years, hence, AMA 2008 definition reads: marketing is the activity, set of institutions and processes for creating, communicating, delivering and exchange offerings that have value for customers, clients, partners and society at large.

According to Olukosi *et al* (2007), agricultural marketing can be defined in two ways: first is the micro view point which is concern with the individual participants in marketing be it the farmer or the business firm. While the second definition focuses on macro viewpoint which sees marketing as the total system of economic activities concerned with the flow of agricultural products from producers to final consumers.

Also, Olukosi *et al* (2007), observed that retailers are middlemen who obtain supplies and display them for sale in forms and times and places convenient for the consumer.

Fuelwood is one of most important source of domestic cooking and heating (energy) especially in the rural areas despite the fact that it is difficult to flame, smoky and hazardous for children. Village people and other collectors collect their fuel wood and sometime gather and sell and make some income out of it. Nzeh and Eboh (2007), noted that forest contributes directly and indirectly to rural household livelihood through the generation of income and employment from the

sale and exchange of gathered and processed forest products such as fuelwood among others.World Bank (2000), noted that in sub-Saharan Africa countries especially Nigeria, fuelwood is the dominant source of energy for cooking and other activities. Not less than 73% of rural areas and urban households respectively rely upon fuelwood as their major source energy for cooking. In urban areas most people who use fuelwood buy in small bundles of wood or charcoal while in rural areas people often gather their own fuelwood and sometimes rural people earn small amount of income by gathering fuelwood for cities.

However, fuelwood collection has serious environmental implications. It leads to deforestation and erosion among other things, and the demand of fuelwood is directly related to population growth. Adamawa State Economic Empowerment and Development Strategy (ADSEED 2004), noted that the state used to be like a "Garden of Eden" with more people now there is very serious exploitation of natural resource beginning with cutting down of trees for shelter and cooking and exploitation of wild animals and fish. And that no one would ever thought that these resources are exhaustible.

Furthermore, Agro forestry Today (1993), showed that about 25% of the global warming effect is attributed to the clearing of tropical rainforest at the rate of 17 million hecter per year. Also, Spore (2007), reported that African lost over nine percent of its trees between 1990 and 2005 and this represent half of global loss. Bigger losers in this regard are Angola, Cameroon, DR Congo, Nigeria, Sudan, Tanzania, Zambia and Zimbabwe

1.2 Problem Statement

The use of fuelwood has been on the increase due to increase in cost and scarcity of the alternative sources particularly kerosene Paul (2008). In addition to the fact that fuelwood is easy to come by is often consumed in extravagant quantities.

In fact much has been known about the use, effect and exploitation of fuelwood but barely little is known about marketing of fuelwood in Yola-South, Adamawa. Increases without a well developed marketing system, all the possible gains from the production effort would only go down the drain Kadas (2008). Similarly, Salisu (2008), showed that the efficient functioning of the market system is based on a number of conditions. These include the existence and efficiency of certain legal and institutional foundation that guarantee private property, a well developed infrastructure that ensures reliable access to transportation and communication at minimum cost, and ready information about quality that must be symmetric.

More often than not, marketing of fuelwood has been facing the problem of lack of uniform measure, high transport cost and storage among other things. Due to these reasons the study sought to answer the following questions;

a) What are the socio-economic characteristics of fuelwood marketers?
b) What are the marketing channels of fuelwood.
c) What are the cost and returns and marketing margin associated with fuelwood marketing?
d) What are the influences of some socio-economic characteristic and cost variables on gross margin?

e) What are the problems affecting fuelwood marketing?

1.3 Objective of the Study

The broad objective of the study is to determine the economics of fuelwood marketing in the study area. Specifically the study would;

1) Analyse the socio-economic characteristics of fuelwood marketers in the study area.
2) Determine the marketing channel of fuelwood.
3) Estimate the cost and returns and marketing margin of fuelwood marketing.
4) Analyse the influence of some socio-economic characteristics and cost variables on gross margin.
5) Analyse the marketing problems of fuelwood.

1.4 Significance of the Study

Fuelwood is among the important items in household shopping. According to Paul (2008), the amount of energy available for domestic use play a critical role in the sustenance of household as this determines the efficiency and control in their utilization. The choice of the type of domestic energy by household is also determined by the affordability and willingness to pay for the services.

It is therefore important to analyse the activities of fuelwood marketing. At completion, the study will be useful to many people. It will be important to other researchers, government and policy makers and marketers in the study area. Other researchers will find it as a reference material for similar research and it will also serve as a base on which further research work can be built upon. It will

be of interest to fuelwood marketers for figuring out strategies that will ensure better operation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Trends of Fuelwood Marketing

Two among the major problems of the world are the increasing amounts of the greenhouse gasses in the atmosphere and the reduction in the world's usable arable land (Agroforest Today, 1993). According to Nash Cecilia, (2006), concern about the use of firewood started in the 1970's and the increased due to rise in the costs of fossil fuel and other sources of energy. Firewood demand was seen to be out pacing sustainable supplies and catastrophic projections for year 2000. An estimated 2000 million people in 1981 were dependent on firewood and other biomass fuel of which more than 100 million were unable to meet minimum requirement. By mid 1980's however, the result of first evaluation of the fuelwood programmes were emerging and questions began to be raised about the importance of wood-lot programmes in addressing the problem. There was increasing realization that fuelwood use was having less impact on forest degradation than was previously assumed. In addition the woodlots were not playing the hope-for role in meeting fuelwood demand and were doing little to increase rural supplies.

In the United Stated, trees are either process into timber or paper products. Few people rely on wood as a major source of energy. In many parts of the developing world, however, wood is a primary source of household energy. The global use of fuelwood has been growing in line with population growth, so that the annual growth in demand is between 3 and 4 percent depending on the

country. Moreover energy consumption in rural areas of Africa is still low and limited almost exclusively to fuelwood (World Bank, 2000).

Africa south of Sahara shows a yearly increase in the trade, saw-logs, veneer logs and log for sleepers and other industrial wood and fuelwood. In low income countries the consumption of fuelwood energy by household is typically ten times the total consumption of commercial energy for all purpose (BENDL, undated). In the same vain, Nash and Cecilia (2006), showed that fuelwood rises was further encouraged by a widespread assumption that by the end of the century much of Africa would have been deforested to provide fuelwood for the poor. The belief that the fuelwood crises were major factor in forest degradation has had the most direct implications for forestry. They outlined four main strategies which were put forward for dealing with fuelwood shortages; fuelwood substitution, fuel efficient stoves, improved fuelwood production through better management of the existing resources and additional fuelwood resources through plantation and farm forestry.

According to Edmund (2005), Nigerian agriculture faces a set of challenges common across sub-Saharan Africa such as limited capital, small size land holding, declining soil fertility, deforestation and unsustainable land use. Nigeria was once covered by widespread vegetation comprising of limited tropical forest in the south and savannah grassland in the north. A great percentage of this luxurious vegetation has been cleared by the pressure mounted by human activities. Presently, forest resources cover about 10 percent of the nation, mostly of savannah woodland type. The southern rain forest is the source of the

country's timber resources, cover only two percent of the total land area of Nigeria. It is being depleted at annual rate of 3.5 percent. The annual rate of change in total

forest area from 1900-2000 stood at 4.0 million hectares. Also, Mandie (2003), showed that population is growing in the country at the rate of 2.8% annually. And these forest areas are disappearing yearly.

World Bank (2000), revealed that fuelwood is the dominant source of energy for cooking and other activities as presented on Table I.

Table 1: **Major Sources of Energy for Cooking.**

	RURAL	**URBAN**
Wood	73%	21%
Kerosene	11%	52%
Wood-imported stove	9%	12%
Others	7%	15%

Source: World Bank (2000)

The principal environmental problem in agricultural areas of Nigeria is land degradation in form of erosion, soil fertility loss, severe moisture stress and deforestation resulting from fuelwood gathering, increasing intensive land use systems combined with low technological (Oladeebo, 2003).

Oronsaye (2003), the destruction of trees and natural ground cover alter the water retention characteristics of the soil. Our young once should be thought how to conserve trees especially through conservation club in schools so that there could be wood for roofing houses, making furniture and carving that will generate income.

2.2 Fuelwood Marketing

In Nigeria fuelwood marketing is one of the major economic activities and it raises concern about how our natural resources are disappearing. The product is

highly localised and it is not economically viable to transport it to great distance. The future of the fuelwood industry therefore depends as much on the question of

accessibility to population as on the growth of suitable trees. An important factor is rapid urbanization, combined with high rate of population increase (Morgan, 2004). Spore (2007), showed that the extent of marketing of forest products depends on income generation, the accessibility of markets, the quantities of the products that are available as well as the time available for collection and sale. Sale is a predominantly seasonal activity which is at its height during the slack periods, when less time is required for farming activity and the need for cash is high. The marketing of many forest products is specialized involving producers (gatherers), wholesale traders in rural, regional and urban areas, and retail traders. While most people and especially farmers participate in these activities seasonally, or on a part-time basis, these activities provide employment for rural and urban people.

Eric (undated), showed that at subsidized official prices for kerosene, liquefied petroleum gas (LPG), and electricity, fuelwood is more expensive on a net usable heat basis, but the high capital cost of stove for these fuels prevents many household from switching. Moreover, these fuels are often only available at much higher parallel market prices, which result in wood being the less expensive choice. There is little prospect of coal, solar cookers, or biogas digesters.

2.3 Socio-economic Characteristics

According to Adebayo and Onu (1999), the socio-economic attributes of farmers affect their decision making and level of use of conventional inputs and

technology. Some of the relevant socio-economic characteristics of the farmers in this regard include; age, level of education marital status, land ownership, access to credit and etc.

Agroforest as a natural resource improves the socio-economic livelihood of rural people through income generation, improve human welfare, supply of food and nutrition fuelwood, fodder for animal consumption as well as employment generation (Mandie, 2003).

Furthermore, Nash and Cecilia (2006), indicated that the reasons for rise in the use of fuelwood include rural and urban poverty, low agricultural productivity, inequalities in land holding and security of tenure, the collapse of traditional resource sharing practices, rapid urbanization, sharp division in the socio-economic roles of women and men and in some countries external pressure resulting in economic crises and war.

For instance, the marginal productivity and productive efficiency, physical energy to work, managerial ability and interest are assumed to increase with age (Nzeh and Eboh, 2007). Moreover fuelwood marketing in Cote Divore is dominated by women, but as the volume of trade expands, men are becoming increasingly involved. This shift may be occurring because men have both time to spend on these activities and access to transportation Similarly, in Ghana fuelwood production for trade was carried out largely by men, while the marketing of fuelwood (middlemen, wholesalers, retailers) was dominated by women and the collection of fuelwood for home consumption is still primarily women's activity (anonymous, undated)

Yesufu (2000), revealed that as in all human endeavours, however, it is necessary to keep in mind all the time that where economic progress stops, decline literally begins. It is the combination of the multi-variant and multi-dimensional effort and activities that sustain and improve man's (including woman's) effort not

merely to maintain, but to improve on current level of economic performance and social welfare that we term human resources development. He pointed out that individual personal development enables him or her to rise from the low depth of complete illiteracy level and in the process acquire more learning and the intellectual capacity to adapt to or understand more complex situations. Likewise, Okojie (1995), showed that human capital is the abilities and skills of the human resources of a country while human capital formation refers to the process of acquiring and increasing the number of persons who have the skills, education and experience which are critical for the economic and political development of a country.

Anthony *et al* (1999), conceptualised development as the process of improving the socio-economic conditions of people who reside in rural areas. He further stressed that as a process rural development involves planning and implementing policy goals with the aim of improving the socio-economic conditions of rural people, especially in the following areas, agriculture, transportation, communication, housing, employment, health, education, manpower development, reduction in poverty, land use, community facilities and services, industrializations and recreation.

CTA (1995), reported that woman play a rather negligible role with regard to forest and fruit products, however, they must become increasingly involve because they are also concerned by problem regarding environmental protection and since most of them use fuelwood for cooking, they must be involve in producing fuelwood.

2.4 Marketing problem

Nash and Cecilia (2006), reported that fuelwood situation is hampered by lack of reliable information. Only a very small fraction of fuelwood production is recorded and greater part of consumption is by poor household and is seldom reported.

Adenikinju and Oyaranji (2000), indicated that several attempts have been made to explain the African growth performance such factors as low level of savings, low level of investment poor technology, and inappropriate government policies. Similarly, Anthony *et al* (1999) stated that the factors which contributed to marketing problems include the nature of the agricultural commodity and the way in which the producers are often very small scale and scattered over large areas. He further revealed that agricultural production takes place in the poorly developed rural areas, their products are rarely uniform in size or type or time of harvesting. It is very difficult and expensive to plan for the assembly, processing, and distribution of such varied types of commodities.

Ojo (1991), noted that there are at least four services or facilities which if not supplied adequately can reduce the performance of the marketing system as well as inhibit the free flow of goods within the country. These services and

facilities include; market information, commodity standardization, handling and packaging, credit facilities. He further stressed that the Federal Office and Statistics (FOS) and all state government agencies compile on a monthly basis some market price data and annual food production data. But these were not only of limited coverage, but are also not adequately disseminated to market places and

centres. Most of the time, the information from such data is of little use since there is a long lag in releasing it.

2.5 Marketing Cost and Margin

According to Olukosi *et al* (2007), marketing costs are the actual expenses incurred in the performance of the marketing function as a commodity moves from the farm to the ultimate consumers. It includes the cost of transportation and handling, market charges, cost of assembling, processing, distribution, cost of packaging, sales promotion and advertisement cost and other costs such as taxes levies and excise duties. He further observed that marketing costs are often erroneously assumed to be synonymous with marketing margin but the true relationship is that marketing margin includes marketing cost plus the normal profit (or loss) earned by the market intermediaries as the commodity passes through marketing system. Marketing cost consists of fixed and variable costs.

Anthony *et al* (1999), noted that, apart from the farm gate prices paid to the farmers, the middlemen and distributors incur additional costs such as handling charges paid to labour for grading, sorting, loading, off-loading and stacking. There are transportation charges and rental payments in warehouses stores at the market. Also, middlemen add their profit margin which includes payment for \

work done and any anticipated loss through shrinkage, spoilage, pilfering or delays in selling that tie down capital. Furthermore, in the retail stage, produce is displayed and sold in small quantities to consumers. The retailer must have storage facilities and be equipped to protect the goods until they are sold. Part of the risk borne by the retailer is the chances of deterioration, shrinkage and loss of value over time.

CHAPTER THREE

METHODOLOGY

3.1 Study Area

The study was conducted in Yola-South Local Government Area of Adamawa State. Yola South is located between latitude 9^0 14N and longitude 12^0 38E and has an altitude of 185.9m. It is bordered in the west by Mayo Belwa, Furore LGA in the east-west, Girei is on the north while Demsa is from west to north. According to National Population Commission NPC, 2006.Yola-South has a population of about 194,607 people. There are about 100,282 males while the females constituted 94,325. The wards in the area included; Adarawo, Bako, Bole, Yolde Pate, Makama A, Makama B, Mbamba, Mbamoi, Namtari, Ngurore Toungo and Yolde Kohi.

Adebayo (1999), pointed out that the annual rainfall in the area is less than 100mm while the annual maximum temperature ranges between 39^0 C to 45^0 C. Moreover the area is characterised by a tropical wet and dry climate. The rain commences from April and ends by October while the dry season begins around November and ends by April. This period is marked by the presence of dust-laden North-Easterly trade wind from the Sahara desert known as Hamattan. The period is cold and dry.

Major crops grown in the area included plantain, guava, garden egg, lettuce, cabbage, pumpkin, carrot, pepper, okra, kenat, cotton, cocoyam, sweet potato, bambara nut, Soya bean, cowpea, groundnut, millet, sorghum, rice, maize (ADSEEDS,2004).

Yola-South has basic infrastructures like Banks, Hospitals, Electricity and good road networks. Yola Market holds daily and provides almost all kinds of consumer goods. There are Filling Stations and Black Markets which supply Petrol, Cooking gas and Diesel.

3.2 Method of Data Collection

Primary data was used for the study. Primary data were obtained through the use of structured questionnaires. In some occasions the Marketers were directly interviewed and their responses were accordingly entered into the questionnaires.

3.3 Sample Size and Sampling Techniques

Hundred (100) persons in the business were selected using simple random sampling technique in Yola-South.

3.4 Method of Data Analysis

Data were analysed using descriptive statistics and inferential statistics.

3.4.1 Descriptive Statistics

Descriptive statistics used included frequency distribution, percentages and means to analyse objectives 1 and 5.

Budgetary technique involving gross margin analysis was used to determine the cost and returns associated with the business. Gross margin was used because of the negligibility of fixed costs to analyse objective 3.

3.4.2 Gross Margin

Gross margin (Gm) is the difference between the gross farm income (GI) and the total variable cost (TVC).

GM= GR-TVC

Where:

GM = gross margin in Naira per bundle

GR = gross revenue in Naira

TVC = total variable cost

3.4.3 Marketing Margin

The marketing margin was used to determined objective 3. Marketing margin is the difference between the price paid by purchaser (consumer) and that received by seller as expressed;

$$MM = \frac{CP - SP}{CP} \times 100$$

Where:

MM = Marketing Margin

SP = Seller`s Price from Fuelwood

CP = Cost Price of Fuelwood

(Iheanacho, 1997).

3.4.4 Multiple Regression

Multiple regressions were used to determine objective 4 the relationship between gross margin, socio-economic characteristics and cost variables. The general form of the equation is,

$Y= F(X_1, X_2, X_3, X_4, X_5, --+X_7+Ui)$.

Where;

Y= gross margin

F= is a functional relationship

X_1-Xn= marginal variables used in the model

The general regression model which was tried included; linear function, exponential function, semi log function and double log function.

The four functional forms were;

a) Linear function

$Y= b_0+b_1X_1+b_2X_2+b_3X_3+b_4X_4+---b_7X_7+Ui$

b) Exponential function

$InY = +b_0+b_1X_1+b_2X_2+b_3X_3+b_4X_4+---b_7X_7+Ui$

c) Semi-log function

$Y= Inb_0+b_1InX_1+b_2InX_2+b_3InX_3+b_4InX_4+---b_7InX_7+Ui$

d) Double log function

$InY= Inb_0+b_1InX_1+b_2InX_2+b_3InX_3+b_4InX_4+---b_7InX_7+Ui$

Where;

b_0= intercept constant

b_1-b_2-bn= regression coefficient to be estimated

Ui= error term

In= nature logarithm

Y= total revenue of fuelwood

X_1= market tax naira/month

X_2= cost of transportation naira/month

X_3= cost of ropes naira/month

X_4= labour

X_5= number of bundles

X_6= marketing experience

X_7= main occupation

Criteria used for the selection of best fit

I. Econometric criteria

II. Economic criteria

III. Statistical criteria

CHAPTER FOUR

RESULTS AND DISCUSSION

The chapter presents results of the analyzed data. Data were analyzed and discussed under the following: socio-economic characteristics of fuel wood marketers, channel of fuel wood marketing, cost and returns, influence of some socio-economic characteristics and variable costs on gross margin, marketing margin and problems associated with fuel wood marketing.

4.1 Socio-economic Characteristics of the Respondents

The socio-economic characteristics discussed include: age, gender, marital status, household size, educational background, marketing experience and membership to market association.

4.1.1 Age

Table 4.1 shows the distribution of respondents according to age. Analysis of the result in Table 4.1 reveals that 10% of the respondents were below the age of 20 years. 30% were between the age groups of 21 and 30. Majority (40%) of the respondents fell between the age bracket of 31 and 40. While 20% were above 41years of age. Age plays a critical role in the business, the more energetic the population the higher the possibility to perform better than the very young or very old marketers.

Table 4.1: Distribution of the Respondents According to Age

Age (years)	Frequency	Percentage (%)
20 and below	10	10
21-30	30	30
31-40	40	40
41 and above	20	20
Total	**100**	**100**

Source: Field survey, 2009

4.1.2 Gender

Table 4.2 shows the distribution of respondents according to gender. Analysis of the result in Table 4.2 shows that 63% of the respondents are males as against 37% females. The fear of abuses such as rape, extortion and assault by unknown men in the process of gathering fuel wood in the forest may be responsible for the predominance of male in the industry. Fidelia (2005), reported that gender difference can be seen in roles, responsibilities, access to resource constraints and opportunities among other things, hence fuelwood marketing is an occupation of the male gender than of the female.

Table 4.2: Distribution of Respondents Based on Gender

Gender	Frequency	Percentage %
Male	63	63
Female	37	37
Total	**100**	**100**

Source: Field survey 2009

4.1.3 Marital Status

Table 4.3 shows the distribution of respondents according to marital status .Analysis of the result in Table 4.3 reveals that majority (73%) of the respondents were married while 19% were single. The widowed/widowers and divorced/divorcee constituted only 6% and 2% respectively.

This result agrees with the findings of Taphee (2009), who reported that married people have more responsibilities such as the provision of foods, education and health of their children while single people have lesser responsibilities.

Table 4.3: Distribution of Respondents According to Marital Status

Marital Status	Frequency	Percentage (%)
Married	73	73
Single	19	19
Widowed/widower	6	6
Divorced/divorcee	2	2
Total	**100**	**100**

Source: Field survey, 2009

4.1.4 Family Size

Table 4.4 shows the distribution of respondents by family size .Analysis of the result in Table 4.4 shows that majority (66%) of the respondents have family size of between 1 and 5 persons, while 31% of the respondents have between 6 and 10 persons in the household. Only 4% have above 11 persons in the household.

Table 4.4: Distribution of Respondents According to Family Size

Family size	Frequency	Percentage (%)
1-5	66	66
6-10	31	31
11 and above	4	4
Total	**100**	**100**

Source: Field survey, 2009

4.1.5 Educational Background

Table 4.5 shows the distribution of respondents according to educational background .Table 4.5 reveals that 55% of the respondents had no formal education, 26% of the respondents attended primary school education while 18% and 1% had secondary and tertiary education respectively .The result shows that the literacy level among the respondents is low which implies that educated people do not normally engage in such business due largely to the ease of securing better jobs.

Yakub (1997), stated that education uplifts the social and economic status of the person who acquires it.

Table 4.5: Distribution of Respondents Based on Educational Background

Educational background	Frequency	Percentage (%)
Non formal	55	55
Primary	26	26
Secondary	18	18
Tertiary	1	1
Total	**100**	**100**

Source: Field survey, 2009

4.1.6 Main Occupation

Table 4.6 shows the distribution of respondents according to main occupation. Table 4.6 indicates that majority (65%) of the respondents were farmers, while 34% and 1% are traders and hunters respectively. Since the industry is dominated by farmers, it means that firewood business will be markedly affected by season due to the attention and time it would receive. Farmers spend substantial part of their time on their farm during raining season and would only concentrate on firewood marketing business during the dry season.

Table 4.6: Distribution of Respondents Based on Main Occupation

Main Occupation	Frequency	Percentage (%)
Farming	65	65
Trading	34	34
Hunting	1	1
Total	**100**	**100**

Source: Field survey, 2009

4.1.7 Marketing Experience

Table 4.7 shows the distribution of respondents according to marketing experience. Analysis of the result in Table 4.7 reveals that 80% of the respondents had less than 9 years experience in fuel wood marketing, while 12% had between 10 and 19 years of experience. Only 6% of the respondents had marketing experience of between 20 and 29 years, while 3% had a minimum of 30 years experience in the business. This implies that the more years marketers spent in the business the less likely they remain in the business.

Table 4.7: Distribution of Respondents Based on Marketing Experience

Years of experience	Frequency	Percentage(%)
1-9	80	80
10-19	12	12
20-29	6	6
30 and above	3	3
Total	**100**	**100**

Source: Field survey, 2009

4.1.8 Membership of Market Association

Table 4.8 shows the distribution of respondents according to membership of market association. Table 4.8 reveals that only 10% of the respondents belong to fuel wood marketing association while 90% do not belong to any association. These imply that firewood marketing business in the study area is usually undertaken by marketers who are not organized into any association.

Table 4.8: Distribution of Respondents According to Membership of Market Association

Market association	Frequency	Percentage (%)
Yes	10	10
No	90	100
Total	**100**	**100**

Source: Field survey, 2009

4.2 Marketing Channel of Fuelwood

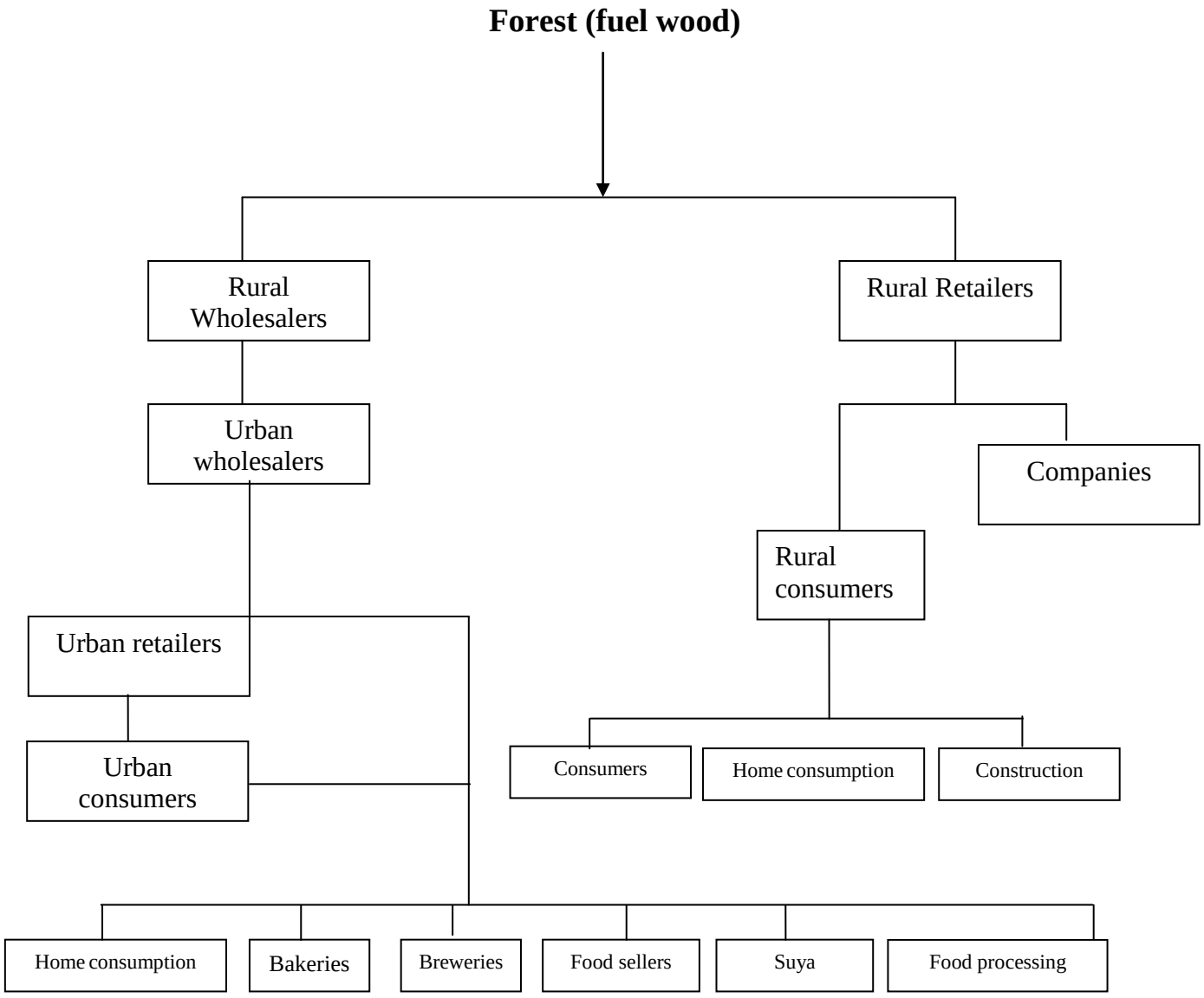

Fig 1. Marketing Channel of Fuelwood in Yola-south

Figure 1 shows the distribution channel of fuelwood. From figure 1 it shows that the urban retailers who buy from urban wholesalers sell the product to home users, bakeries, breweries, food sellers, kebab (suya) joints, and local food processing units. Rural retailers either use it at home or hewn down the product in large quantities for cash to companies like AFCOTT from the nearby forest .

The retailers display the fuel wood in time and form convenient for the consumers. For bulk purchases the consumers can deal directly with wholesaler thereby by passing the retailers.

According to Olukosi *et al* (2007), marketing channel is the path of a commodity from its raw form to the finished form. Akpan (2003), stressed that fuel wood, like food, is brought into urban centers from the surrounding region on a daily basis. It is extracted from the farmlands and from dead trees and living trees and are used as fuel wood. From the figure it shows that the forest serves both rural and urban areas with fuelwood. The rural areas make use of the product for domestic cooking and heating. Similarly, Ogunwale (2004) showed that trees are the principal source of fuel and construction material in rural areas and had contributed to environmental degradation of fragile agricultural land.

4.3 Profitability of Fuel Wood Marketing in the Study Area

Table 4.9: Average Costs and Returns of Fuel wood per Month.

Items	Cost (Value in Naira)	Percentage of total cost
Total Revenue		
Sales of fuel wood/month	13,266.08	
Fixed Cost	-	
Variable cost		
Market tax	506.95	4.6
Cost of ropes	33.99	0.31
Labour	121.35	1.1
Cost of transportation	113.28	1.0
Cost of fuelwood	10,357.6	93.0
Total variable cost (TVC)	11,133.17	
Gross margin TR-TVC	2,132.91	100

Source: Field survey, 2009

Table 4.9 reveals the analysis of costs and returns associated with fuel wood marketing. The market tax constituted 4.6% of the total variable cost while cost of ropes constituted 0.31% of the total variable cost. The average monthly cost of labour and cost of transportation were N121.35 and N113.28 constituted N1.1% and 1% respectively. The average monthly sales revenue is estimated to be N13,266.08, while the average monthly total variable cost is estimated to be N11,133.17. Therefore, the gross margin being the difference between total revenue and total variable cost is N13,266.08 – N11,133.17. The retailers make an average profit of N2,132.91 on fuel wood per month as revealed by the gross margin.

Season is one of the dwindling factors affecting fuelwood marketing. The supply of the product substantially reduced during the raining season thereby raising the demand and this translate into increase in profit as a result of marketers and gatherers who come from nearby states or neighbouring countries like Niger. Also local farmers switch into the business during off-season operations in order to make some cash.

4.4 Marketing Margin

Cost of fuelwood constituted 93% of the total variable costs .The average monthly cost of fuelwood was purchased at N 10,357.6 and sold for N 13,266.08 on the average. The figures were extracted from Table 4.3 hence the analysis is as follows;

Market margin = $\frac{\text{Cost price – Seller's price}}{\text{Cost price}}$ X 100

= $\frac{10,357.6-13,266.08}{10,357.6}$ X 100

=28.08%

Analysis of fuelwood marketing margin shows 28.08% was the final selling price received by the retailers while the remaining 71.92% goes to wholesellers and gatherers of fuelwood in the industry .The high percentage (71.92%) captured by the gatherers and wholesellers could well account for the reason why they remain in the business.

4.5 Multiple Regressions.

Four functional forms were tried and linear function gave the best fit, hence was chosen as the lead equation. It is thus, presented:

$Y = -1014.912 – 0.384X_1 – 46.273X_2 – 9.413X_3 + .374X_4 + 6.938X_5 + 723.026X_6 + 543.691X_7$

(-1.975)*** (-1.264) (-.094) (-2.081)** (.310) (3.656)* (11.175)* (1.880)***

Where

F = 72.024*

*= 1% level of significance

**= 5% level of significance

***= 10% level of significance

R^2 = coefficient of determination = 0.846

From the regression result seven explanatory variables were used which include; market tax, cost of transportation, cost of rope, labour, number of bundles sold, market experience and main occupation. Four of these variables had

significant influence on the gross margin namely; cost of ropes, number of bundles sold, market experience and main occupation.

The variables included in the model have explained 84.6% of the variation in the dependent variable (gross margin) as revealed by the coefficient of multiple determination (R^2). Only about 15% of this is accounted by error. The model is significant at 1% as shown by the magnitude of F-statistics.

Cost of Ropes (X_3)

The analysis shows that the cost of ropes which is significant at 5% with -.096 coefficient is inversely related to the gross margin implying that expenditure on ropes by fuel wood marketers reduces their profit margin.

Number of Bundles (X_5)

Number of bundles purchased by marketers is significant at 1% level with .238 coefficient and positively related to profit implying that the more bundles that are bought by marketers for subsequent reselling the more profit they make.

Market Experience (X_6)

Experience is statistically significant at 1% .715 coefficient which means that marketers that are experienced in fuel wood marketing tend to make more profit than those that are not experienced. Experience in marketing would have enabled them to have more marketing skills and more customer relationship which will positively influence their profit level.

Main Occupation (X_7)

The main occupation of the marketers is farming. It is however significant at 10% probability level with. 090 coefficient which means that farmers that are into fuel wood marketing tend to have higher profit than non-farmers, because

farmers collect fuel wood directly from the farm or forest themselves, hence need not to pay for cost of fuel wood. However, marketers that are non-farmers buy from other farmers or markets where they have to resale at higher rate to make profit.

Table 4.10 Result of Regression Analysis

Variable	Parameter	Coefficient	T –ratio
Constant			-1.957***
Market tax	X_1	-.059	.1.264
Cost of transport	X_2	-.004	-.094
Cost of rope	X_3	- .096	-2.081**
Labour	X_4	.014	.310
Number of bundles	X_5	.238	3.656*
Market experience	X_6	.715	11.175*
Main occupation	X_7	.090	1.880***

***Source*:** Computer print out

* Significant at 1%

** Significant at 5%

*** Significant at 10%

4.6 Problems Associated with Fuelwood Marketing.

Table 4.11 presents the problems faced by fuelwood marketers in yola-south, Adamawa state.

High Tax

High tax is ranked first with 18.36% of the marketing problems. It therefore shows that increase in the amount of tax might discourage marketers from the business and vice versa

Irregular Seasonal Sales

Forty five of the respondents constituting 12.71% complained that during the slack period there is high number of marketers in the business thereby reducing the profit margin because of fluctuation in the prices of fuelwood.

Theft

Theft of fuel wood at selling points has 11.86% of the marketing problems.Fuelwood lost as a result of theft cannot be accounted for and this tends to lower the profit of the business.

Inadequate Credit Facility

Some respondents (11.30%) attributed inadequate credit as their major problem. Inadequate capital will lead the marketers to operate in a smaller volume. If they have access to credit there is the tendency to expand the business.

Damage

Damage constituted 10.73% of the marketing problems .Damage either due to insects attack or rain water reduce the quality of fuelwood thereby resulting to low return.

Inadequate Storage Facility

Inadequate storage is ranked sixth with 28 respondents (7.91%).Damage or theft happens as a result of inadequate storage facility, with proper and adequate storage facility losses due to theft and insects attack will slim down and this increases profitability of the business.

Undried wood

Respondents (8.47%) who sale undried or fresh fuelwood make less profit from the business because customers do not buy their product. Undried fuelwood is normally difficult to burn or flame by the end users.

Poor Road Network

Poor road network constituted 5.65% of the problems faced by fuelwood marketers among other things which include; increased cost of fuelwood, deny access to potential arears of collection and much time spent in the process of delivery .This therefore add to cost of fuelwood.

Government Policy

Government policy had 4.24% of the problems.The government policy is in two-fold One is in form of tax imposition to discourage felling down of trees and as a source of revenue to the government .While the second policy is prohibition of indiscriminate cutting down of trees especially economic trees. However, these make it difficult to source fuelwood from the nearby surrounding.

High Cost of Fuelwood

Eleven respondents (3.11%) ascertained high cost of fuelwood as the major problem grappling the industry .The demand of fuelwood is inelastic, increases in price of fuelwood would lead to minimal decrease in demand. The findings reveals that those that uses fuelwood as source of fuel (energy) use it as the last resort as against its substitute (kerosene) no matter the increase in price consumers will still go for it.

High Transportation Cost

High transportation cost with 3.11% of the problems affects the business. Adekanye (1988), reported that transportation cost accounts for 70% of marketing a product which is not in line with the findings .This may likely be as unaccountable cost incurred or lack of proper record keeping by the marketers.

Health Hazard

Health hazard had negligible percentage (1.98%) as the problem associated with the business. Injuries in the process of cutting or splitting the log (fuelwood) may be sustained by the marketers .Also gatherers/collectors of fuelwood may come in contact with dangerous reptiles like snakes. These therefore, discourage the marketing of the product.

Table 4.11: Problems of Fuel wood Marketing in Yola-South

Problems	Frequency	Percentage (%)	Rank
High Tax	65	18.36	1
Irregular seasonal sales	45	12.71	2
Theft	42	11.86	3
Inadequate credit facility	40	11.30	4
Damage	38	10.73	5
Inadequate storage facility	28	7.91	6
Undried fuel wood	30	8.47	7
Poor road network	20	5.65	8
Government policy	15	4.24	9
High cost of fuel wood	13	3.67	10
High transportation cost	11	3.11	11
Health hazard	7	1.98	12
Total	**354***	**100**	

Source: Field survey, 2009
*Multiple responses

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

Marketing of fuelwood begins from the forest and ends in the rural or urban area. It involves the physical cutting down of death or live trees, conveying it either on head, bicycle, and motorcycle, donkey and pick-up van to the point of interest (sale). This study examined the fuelwood marketing in Yola-South Local Government of Adamawa State.

Primary data was used for the study and was collected by the use of structured questionnaires administered to a random sample of 100 respondents. The analytical tools employed for the study were; descriptive statistics which included frequency distribution and percentages, and inferential statistics which involve the use of multiple regression, marketing margin and gross margin analysis.

The findings of the study revealed that majority (73%) of the respondents were married men and were mostly farmers. A greater (55%) number of them had no formal education and possessed marketing experience of less than 9 years. Their family size ranges between 1 to 5 persons.

The marketing channel shows that the rural retailers sale to rural consumers and some companies, e.g AFCOTT. The rural wholesalers who buy in bundles sale to urban wholesalers who then sale the fuel wood to urban retailers or final consumers.

The gross margin analysis revealed a positive average monthly gross margin of 2,132.91 naira , while the marketing margin was estimated to be 28.08%.

The multiple regression analysis was used to determine the influence of some variable on gross margin. Four of these variables showed significant influence on the gross margin namely; cost of ropes, number of bundles, market experience and main occupation. The variable s included in the model explained 84.6% of the variation in the dependent variables as revealed by the coefficient of multiple determinations (R^2). The overall model was significant at 1% probability level as shown by the magnitude of the F-statistics. Major problems of the respondents included undried fuel wood (8.47%), tax (18.36%), theft (11.86%), damage, health hazard (1.98%) and irregular seasonal sales (12.71%) were the major problems affecting fuel wood Marketers.

5.2 CONCLUSION

From the study, it has been observed that the marketing of fuelwood involves different agents namely; gatherers, rural and urban wholesalers, rural and urban retailers. The sale of fuelwood generates income to the marketers who on the average make N2143.92 as profit per month. Most of the marketers (65%) were farmers who undertake fuel marketing as a secondary occupation

The regression analysis showed a positive relationship between the number of bundles sold (X5), marketing experience (X6) and main occupation (X7) on the gross margin of the business. The business is not spared from setbacks which included; tax (18.36%), irregular sales (12.71%), theft of fuel wood (11.86%) and inadequate credit (11.30%) were identified as the major problems grappling the business.

5.3 RECOMMENDATIONS

While fuelwood marketing was beneficial to the participants of the industry the practice is however not without its attendant consequences in terms of deforestation and its effects on the environment in general. Therefore, recommendation based on the major findings may not go down well with policy makers and those involve in the sustainability of the natural resource endowment. The following recommendations are however proffered:

i. The extent of fuel wood use need to be checked. People should be encouraged to use fuel wood efficient stove which uses less fuel wood and provide enough energy for cooking.

ii. The demand for fuel wood is usually high due to inadequate supply and high cost of kerosene. Therefore, government should ensure adequate supply of kerosene at a much subsidised rate. This would ensure accessibility to kerosene by households and reduce the demand for fuelwood.

iii. Government should intensify campaign through sensitization programmes on the effect of deforestation to the environment. This may entails encouraging of afforestation to replace fell down trees.

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