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Economic Analysis of Plank Production in Gbonyin Local Government Area of Ekiti State, Nigeria

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Abstract: This study examines the economics of plank production in Gbonyin Local Government Area of Ekiti State. Fifty saw millers were selected randomly for the study and the revenues generated were mainly from the cost of milling while fuel (generator) cost and labour cost (34.1 and 38.9% respectively) form the highest percentage of total variable cost of the business. The business is seen as being profitable because the gross margin was close to half of the total revenue. From the normalized profit function, result shows that; mill fueling (generator cost), waste disposal cost, transformer and marital status has contributed significantly to the variations of dependent variable [profit (π)]. These factors were shown to have a great influence and impact on the business in the area. High energy [labour} and large sum of amount spent on fuel characterize these industries due to the cumbersome work and irregular power supply in this area. From the study, it is recommended that government attention and policies should be directed to the area in area of electricity supply. Electricity supply to the area will increase and improve production to a greater height and make the products available to the general populace at affordable prices.

Keywords: Plank production, Saw millers, Economic analysis, Ekiti State

INTRODUCTION

Forests have arguably played a bigger role in the development of human societies than any other resource, the prime direct or marketable product of most forest today is wood for use as timber, fuel-wood, pulp and paper, providing some 3.4 billion cubic meters of timber equivalent a year globally (FAO, 2004). After a 60 percent increase between 1960 and 1990, global wood consumption fluctuates but rose no further during the 1990s largely due to the more efficient use of timber and paper recycling (FAO, 2004).

Wood is the most versatile raw material the world has ever known. Throughout history, people relied on wood for needs varying from farming tools to building materials, from fuel to weapons of hunting and warfare. Wood remains virtually the most predominant material used for construction and energy generation until the last half of the 19th century {Douglas, 1995}. People used timber in the construction of houses, barns, fences, bridges, furniture items and musical instruments. In contemporary times, wood is still widely used for constructional purposes. It is also a valuable industrial raw material for the production of pulp, paperboard, rayon, cellophane, photographic films, tannin, methanol, ethanol, wood adhesives and chemical derivatives. The ubiquitous nature of wood has made it a valuable material in every stage of human development,

thus man depends on wood right from the cradle to the grave.

The wood based industries have contributed to the economy of Nigeria and it was pointed out by Adeyoju {1975, 2001} that in 1963 wood based industries employed 17.5% of the labour force in the country, and 17.4% of the indigenous skilled and unskilled labour.

The sawmills account for 93.32% of the total number of wood based industries in Nigeria in 1997 {Fuwape, 2001}. These mills are concentrated in the Southwestern part of the country with Ekiti, Ondo, Ogun and Lagos states having the largest numbers.

As evidence, demand of plank is rising in almost every part of the country without a balanced supply. The problem of availability of sawn wood have been discovered to be problem that can be attributed to the sawn wood production from the point of felling to the last stage of selling. It is known that there is increase in demand for wood products and there is increase in the prices of these products,

For the wood based industry to meet the demand and to ensure the stability of the forest ecosystems, Oyegade {2000} suggested some strategies which could be adopted by the wood based sector and these are;

i. Production and market development for plantation species
ii. Limiting the area of natural forest to be converted to artificial forest
iii. Improvement in wood efficiency
iv. Improvement in logging operation
v. Improvement in wood protection.

Munro {1974} observed that forest loss is occurring essentially because forest and trees are being used up faster than they are being generated i.e. supply and demand for forest products are not balanced. He now suggested one way of restoring balance or achieving the balance of proper forest in the economy, is to make all those who use the forest to pay the full economic costs for their activities.

Awolola {1997} said this can only be done by guiding against illegal felling of trees which can be done by increasing the number of protection squads and providing them with the required operating equipment and funds.

The third national development plan also worked on ensuring balance between demand and supply of agricultural products, it stated that "there is considerable wastage of agricultural raw materials due to inadequate storage and processing facilities". Akachukwu {1997} gave the total saw milling waste range from 23.5 – 66.0 per cent with his research in determining the total saw milling waste. Fuwape {2001} initially attributed saw mill wastage to inefficient operation of saw milling machines. Akachukwu {1997} now suggested that in order to minimize saw mill wastage small inefficient machines that dominate Nigeria saw mills industry should be replaced with larger efficient machines that can saw small diameter logs from plantations. Also sawmills should be integrated with other wood based industries that can utilize saw milling wastes.

Popoola (2001) connects imbalance demand – supply detriment of forest products to inadequate financial resources. He described wood business as highly capital intensive and for proper marketing and distribution system, this is very important to this end he felt the forest supply

should encourage tree farmers to farm forestry cooperative and organize them accordingly.

It is therefore essential to thoroughly analyse the owners of timber products so that supply could be increased, thereby increasing the production of sawn wood. It should be noted that the number of consumers/buyers is increasing daily affecting the structure of the market. Also since the various prices being charged are the result of the total variable cost incurred in the production of sawn wood, therefore it is necessary to analyze the production performance and efficiency involved. The study will help to discover the problems faced by loggers or fellers involved in the business.

METHODOLOGY

The study was conducted in Gbonyin Local Government Area (LGA) of Ekiti State, Nigeria. Gbonyin LGA was chosen for the study because it is well known in the state for a variety of forest products ranging from planks, oil palm products just to mention a few. Ekiti State is one of the six states constituting the southwest region of the country. It is located in the tropics and has 16 local government areas.

Analytical Techniques

A number of analytical tools were employed in the study and these include; descriptive statistics, gross margin analysis and normalised profit function.

Descriptive Statistics-Descriptive statistics such as tables, percentages and frequency distribution were employed in the analysis of respondents' socioeconomic characteristics.

Gross Margin Analysis

The gross margin was analyzed using the following expression;

GM =TR-TVC

Where : GM =Gross margin

TR = Total revenue

TVC =Total variable

Normalised Profit Function

A profit {or cost} function relates maximized profits {or minimized cost} to the price of products input as also to other exogenous variables such as fixed input or agro climatic and social variables.

Profit = f {input & quantities used}.

Because of scale difference, we normalize input quantities with input price

$\pi = \frac{f\{\text{input quantities per business}\}}{\text{Price}}$

Profit (π) f $\{X_1, X_2 \ldots\ldots\ldots X_{15} + ei\}$

Where, X_1 = cost of mill machinery maintenance (Naira)

X_2 = mill fueling/ generator cost (Naira)

X_3 = Utility bills (Naira)

X_4 = waste disposal

X_5 = Blade replacement

X_6 = labour Cost

X_7 = Other costs

X_8 = Rent on machinery

X_9 = Transformer

X_{10} = Age

X_{11} = Marital status

X_{12} = Tribe

X_{13} = Educational level

X_{14} = Experience in years

X_{15} = Family size

ei = error term

RESULTS AND DISCUSSION

The result of the survey shows that 10% of the saw millers are within the ages 21-30years, 31-40 years (28%), 41-50 years (52%) and above

50 years (10%). The analysis of the data shows that a greater percentage of middle age men (i.e. 41 – 50 years,) were involved in saw mill business in the area. This could be attributed to the nature of the business which requires a lot of energy, ability to stay longer at work and initiative. From Table 1, it is also shown that 100% of the respondents were males, reflecting the observation that, in Nigerian economy most capital intensive and arduous jobs tend to be male-dominated. The findings reflect the dominance of the male in the business.

Furthermore, it is seen that 90% of the respondents are married while only 10% are single. The greater involvement of married people in this business is driven by the desire to increase family income.

According to the table, 62% of the respondents are Yoruba, 34% are Ibo and 4% are Hausa. The high percentage of Yoruba and Ibo shows their interest in Sawmills business and small-scale industries than the Hausa people. Yoruba having the high percentage might be because of their access to land and logs/ wood in their locality.

The table also shows that, 16% of the respondents had Primary education, 35% Secondary education while 46% had tertiary education. This therefore shows that a greater percentage of the respondents are literate. This is due to the fact that a lot of measurements and calculations with management skills are involved in the business. The standard way of measurement is carried out using the Hopper's measurer. This is a book which gives the standard measurement of planks that can be found in certain cubic meter of timber. It is seen that, 12% of Saw millers have 0 – 10 years of experience, 68% have 11 – 20 years of experience while 20% have above 21 years of experience. It shows therefore that due to high cost involved in setting up the business, few entrants are involved at the initial stage (0 – 10 years).

Table 1: Socio-Economic Characteristics of Respondents

Socioeconomic characteristics	Frequency	Percentage
Age (years)		
<20	0	0
21 – 30	5	10
31 - 40	14	28
41 – 50	26	52
>50	5	10
Sex		
Male	50	100
Female	0	0
Marital Status		
Married	40	90
Single	10	10
Tribe		
Yoruba	31	62
Ibo	17	34
Hausa	2	4
Education		
Primary	8	16
Secondary	19	38
Tertiary	23	46
Business Experience (years)		
0-10	6	12
20-Nov	34	68
Above 21	10	20

Moreover, those that are in the business, because of the profitability of the business and their age, stay in the business. But as years goes on many leave the business to their children because a lot of energy is required. On profitability, the gross margin analysis was carried out. From the result shown on table 2, the only major source of revenue for the saw millers is the revenue from milling per cubic of timber (#568,980),while the mean total variable cost is #287,928 from this it can deduced that the gross margin is #281,052.00 therefore the

total variable cost takes over half of the total revenue. The result shows that saw mill business is profitable and saw millers are in business though certain amount will still be set aside as depreciation value for fixed equipment and machinery.

Moreover, labour cost (#112,080) formed about 38.9% of the total variable cost. This shows that more hands {labour} are needed because of the high demand for energy involved in the business. Also, Mill fueling/generator cost is #98,040 which is about 34.1% of the total variable cost. This can be attributed to the erratic power supply to the area therefore leading to a reduced amount paid on utility bills [NEPA, Water etc]

Table 2: Gross Margin Analysis in Plant Marketing

Revenue	**Mean Value (#)**
Revenue from milling	568,980
Total revenue	568,980.00
Variable cost	
Mill maintenance	27,080
Mill fueling/generator	98,040
Utility bills	3,948
Waste disposal	7,640
Blade replacement	26,720
Labour	112,080
Other Costs	12,420
Total variable cost	287,928.00
Gross Margin = Total Revenue – Total Variable Cost	
#568,980.00 - 287,928.00	
Gross Margin = #281,052.00	

From the normalised profit function, result shows that; mill fuelling / generator cost, waste disposal cost, transformer and marital status has contributed significantly to the variations of dependent variable [profit (π)]. These factors were shown to have a great influence and impact on the business in the area. The value of the R2 indicate that about 78.5% of the variation in the dependent variable is explained by the explanatory variables.

From Table 3, it was shown that mill maintenance, utility bill, blade replacement, labour, rent on machinery, age, tribe, education, experience and family size do not affect the dependent variable in saw mill business.

However, Mill fueling/generator cost was significant at 1%, an indication that because of erratic power supply in this area, high cost is incurred on fuel and generator. This has been an important factor in any production industry if they will continue to stay in business. Also, waste disposal is significant at 5%; this mean that as the production increase the waste produced will also increase.

Furthermore, transformer is significant at 5%, this shows that high voltage required in production in saw mills industry, it is quite necessary to have personal transformer. This invariably permits a continuous and efficient production. Also, marital status is significant at 10% this mean that most saw millers are married and have responsibilities {wife, children and other family members} attached to them and will because of this continue in their business to meet up with the family needs.

Table 3: Normalized profit function analysis

Variable	Coefficient	Standard Error
Constant	-20106.618	68617.15
Norm Mill	45.559127	48.45
Norm fuel	-51.61583	13.777***
Norm utility	-7.788075	24.664
Norm waste	433.26151	192.450**
Norm blade	75.48729	50.829
Norm labour	-7.8121	9.897
Norm other cost	-70.8034	57.797
Rent on machinery	-123.250	89.910
Transformer	42479.80	17376.5**
Age	-154.136	94.781
Marital status	3273.53	1692.46*
Tribe	566.768	669.22
Education	-27.586	90.512
Experience	86.904	84.655
Family size	-83.243	250.616
R^2	0.7832	
R^2	0.57519	

Source: Computed from Survey Data, 2007

CONCLUSION

There is no doubt that saw mills industries in Nigeria is an important, but underdeveloped avenue for increasing the nation's revenue while potentially providing employment and enhancing income generation for hundreds and thousands of people. This sector is expected to continue to grow as there are many potentials of industrialization in saw milling / wood base panel industry. However, mill fuelling / generator cost, waste disposal cost, transformer and marital status have contributed significantly to the variations in the profit(π). These factors were shown to have a great influence and impart on the business in the area.

Recommendations

From the study, the government attention and policies should be directed to the area of electricity supply. Many of the sawmills spend part of their profits on buying diesel and generator. Electricity supply to the area will increase and improve production to a greater height and make the products available to the general populace at affordable prices.

The wastes from the forest industries are a valuable raw material capable of stimulating development of rural modern industries in the area. E.g. particle board, pulp and paper and plywood mills or industrialists should be encouraged to site their industries in this area.

Adequate maintenance of machines and equipment, availability and supply of spare parts to replace the worn-out parts is very necessary to reduce fatigue and the high energy required. Also improvement in educational status through capacity building of the residents and this will ensure proper accountability

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