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Assessment of the Economic Contribution of *Pterocarpus Erinaceus* Tree (Madrib) in the Livelihood Sustenance of the Rural People of Southern Taraba State, Nigeria.

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Abstract: *The study was designed to assess the economic contribution of Pterocarpus erinaceus tree (madrib) in the livelihood sustenance of the rural people of Southern Taraba State, Nigeria. Purposive sampling was used to select three Local Government Area from the eight local government areas in Southern Taraba State, due to the availability of the tree species in the area.To achieved this, a well-structured questionnaire were distributed to six council wards randomly sampled from the three LGA selected. One Hundred and Twenty (120) questionnaires were distributed randomly to sample the opinion of the people in the study Area, out of which only One Hundred and Thirteen (113) were successfully retrieved. The data generated were analyzed using simple descriptive statistics including tables and percentages, budgetary analysis technique e.g. gross margin was also used, to analyze the profitability of processing and marketing of Pterocarpus erinaceus in the study area. The result of the budgeting analysis revealed that the total annual income generated from Pterocarpus erinaceus business was₦30, 044000 and an average net income obtained by individual respondent was ₦120, 820.79. The Finding revealed that Pterocarpus erinaceus play an important role in the lives of many people especially the rural people through the provision of food, medicine, wood food for roofing and firewood, livestock feed, Source of income to many by reducing the poverty level of the rural people across ages. Therefore, rules and regulations against indiscriminate cutting of the tree species for alternative uses should be enforced to maximize their value.*

Keywords*: Economic Contribution, Pterocarpus erinaceus, Livelihood, Sustenance, Rural People*

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I. Introduction

Pterocarpus erinaceus is native rosewood specie distributed to the semi-arid Sudan Guinea savannah forest of West Africa. It has slight buttress and when old is up to 75cm in diameter. The tree produces one of the finest woods in the region, where it is grown. The wood is for both local and international utility (Global Time Magazine, 2017). The tree is grown as live fence, wind break as well as shade bearer to some extent in some house hold (Bosu, 2013).

Incomes from environmental sources play an important role inrural livelihoods in developing countries. In particular, products fromforest environmental sources contribute significantly to rural house-holds' economic wellbeing (GetachewMamo*et al*., 2007). Trees are important in the livelihoods of local people in most developing countries. Local people depend on forests resources for various products such as fuel wood, construction materials, medicine, and food. Globally, it is estimated that between ₦1.095 billion and ₦1.745 billion naira generated by people who on forests for their livelihoods (Vedeld, 2007). Moreover, 350 million people who live adjacent to dense forests depend on them for subsistence and income (Langat, *et al.,* 2016). It is estimated that 20–25% of rural peoples' income is obtained from environmental resources in developing countriesand act as safety nets in periods of crisis or during seasonal food shortages.

Chine import of *pterocarpus erinaceus* from West Africa increased by more than 300 fold in value from 21,350 U.S Dollars to 63,943,732 U.S Dollars total Chinese imports during the first quarter of 2015 (Evans, 2012). This import increased by more than 1,700 in volume from $50m^3$ (Total Chinese import during the first quarter of 2015). During the first quarter of 2015, nearly 30% of the total value of China's import of rosewood came from West Africa. West Africa is now competing with the Southeast Asia as the main exporting region of rosewood to China. Available information indicates that Chinese imports of rosewood from West Africa are in fact presently focused on a single species *pterocarpus erinaceus* (Nadro and Modibbo, 2014). Nigeria leads in this trade in rosewood as from 2011 to date (Adam, 2012).

Pterocarpus erinaceus trees are currently one of the most commercial tree in Taraba state as it stand. It generates a huge sum of revenue for the state government and it is also a big source of livelihood for most of the

people involved in its business. But little is known about the contribution of *pterocarpus erinaceus* to the livelihood sustenance of the rural people where the tree is gotten from, beside the socio economic value of the production activities and the product has hardly evaluated. This therefore necessitated this research to be carried out, to help bring to limelight the importance of the need to manage its sustainability for enhance livelihood in the area and beyond since *pterocarpus erinaceus* is abundantly growing in southern Taraba state.

Keeping the above in view and the known possible reasons, the present study was taken up with the following objectives: i)describe the socio economic characteristic of the people in the study area, ii) Evaluate the cost and returns associated with the processing and marketing of the *pterocarpus erinaceus* products, and iii). Identify the problems associated with marketing of *pterocarpus erinaceus* in the study area.

II. Materials And Methods

The study area

Southern Taraba is made of seven local government areas (LGA).They includes Wukari, Ibi, Takum, Donga, Kurmi, Sardauna and Ussa local government area which form the kwararafa Kingdom. The major tribes in Southern Taraba are, Jukun, Kuteb, Mambilla, Ndoro, Hausa Fulani, Tiv and Kaka among others.

The area has two main seasons which are dry and wet season. The wet season is from the month of April to October while the dry season from November to March. The major occupation in Southern Taraba includes farming, grazing, sawing of timber and hunting.

Southern Taraba lies between latitude 6^0 and 8^0North and longitude 10^0 and 13^0 east. It is devoid of hills and others forms of highland, the plain are blessed with fertile loamy clay and sandy loam soil where various crops are grown yearly.

Sampling Method

The study was carried out in Southern Taraba State. Three local Government Areas were purposively chosen for this research due to the availability of the *Pterocarpus erinaceus* there. In the three local Government Areas, two (2) council wards were randomly chosen representing 20% of the total wards in each of the local government area making up six (6) council wards, then in each of the council ward, twenty (20) households was randomly selected and in each household, at least one respondent was interviewed totaling 120 people out of which only One Hundred and Thirteen (113) were successfully retrieved.

Data Analysis

In analyzing the data simple descriptive statistic was employed using table and percentage to analyse the socio-economic characteristics of the respondents, budgeting analysis techniques e.g. Gross margin was also used to process profitability of processing and marketing of the tree species in the area.

See the formula below:

$$GM = TR - TVC$$

Where;

GM = Gross Margin (₦) (total monetary value of *Pterocarpus erinaceus*)
TR = Total Revenue (₦) (Total income obtain from *Pterocarpus erinaceus*)
TVC = Total Variable Cost(₦) (e.g. Cost of transportation, raw material, labour etc.)

Benefit Cost Ration (BCR) will also be used to compare the flow of benefits and cost generated over time by harvesting, processing and marketing of *Pterocarpus erinaceus*

$$BCR = \frac{\Sigma Bt\,(1+r)^t}{\Sigma ct\,(1+r)^t}$$

Where;

BCR = Benefit Cost Ratio of *Pterocarpus erinaceus*
Bt = Total benefit per year from *Pterocarpus erinaceus*
Ct = Total cost incurred at year t (transport cost, raw material, labour etc.)
r = Rate of interest (15% of interest of barrowing capital in the study area.
t = Time (year) where t = 1.

III. Results And Discussion

Socio-Economic Characteristics of the Respondents

The age, gender, marital status, Educational levels are some of the Demographic characteristics of the respondents. The tables revealed that majority of the people involved in the extraction and processing of *pterocarpus erinaceus* aremale. This implies that the men are active and capable of undertaken the stress involve in the extraction and processing of the *pterocarpus erinaceus*. This agreed with the report of table I that male gender constitutes the highest percentage in extracting and processing of *pterocarpus erinaceus*. The finding also revealed that married people are mostly involved in processing of the *pterocarpus erinaceus* than

other category of people. This may have a positive effect on availability of family labour. The result on the Educational level of the respondents revealed that 12% of the respondents have non-formal Education. The lack of Education has serious effect on the conservation of the *pterocarpus erinaceus* specie in the study areas. This lead to indiscriminate felling of the trees without replanting. People with primary education constitute 21%, those with secondary constitute 53%, and those with NCE/Diploma make up 6% while those with HND/Degree constitute 6%. This implies that the category of people involves in processing and harvesting of *pterocarpus erinaceus* are those with secondary schools certificate. The table revealed that the majority of the people involved in the extraction and processing of *pterocarpus erinaceus* are within the age rangefrom 30-40. This implies that the category of people within these age limit are active and capable of undertaken the stress involved in the extraction of *pterocarpus erinaceus*.

Table 1: Socio-economic Characteristic of the Respondents

Variables	Sardauna	%	Takum	%	Kurmi	%
Age						
20 - 30	13	12	22	19	24	12
31 - 40	47	42	31	27	47	42
41 – 50	31	27	47	42	13	12
51 and above	22	11	22	19	31	27
Gender						
Male	89	79	24	21	89	79
Female	24	21	89	79	24	21
Marital status						
Single	44	34	31	27	22	19
Married	62	55	47	42	47	42
Other	7	6	22	19	7	6
Educational Qualification						
No formal education	7	6	9	8	13	12
Primary education	22	19	18	17	27	21
Secondary education	48	43	47	41	62	55
NCE/ND	25	22	25	22	7	6
HND/B.Sc.	11	10	13	12	7	6
Total	**113**	**100**	**113**	**100**	**113**	**100**

Source: Field Survey, 2018

IV. Cost And Returns

Cost and returns of rosewood processing and marketing in the Study area

The result on the gross margin analysis of the *pterocarpus erinaceus* sold in the study area indicated that the cost of processing which is 52.9% constitute large percentage of the total cost of processing *pterocarpus erinaceus*in the study areas, while cost of labour is 16.9% transportation is 17.2% . The total revenue from the *pterocarpus erinaceus* market is ₦30, 044,000. The total variable cost of processing the *pterocarpus erinaceus* is ₦431, 100, while the Total Fixed Cost accounted for ₦15, 960,150. The Profit = Total Revenue - Total Cost = ₦30, 044,000 – ₦15, 960,150. This implies that the business of *pterocarpus erinaceus* is profitable in the study area since the Benefit Cost Ration (BCR) is greater than 1.This agreed with Adeyeye and Dittoh(1985) that investment criteria requires that BCR should be greater than one (BCR>1)before a business can be teamed profitable.

Table 2: Cost and returns associated with Harvesting and marketing of *pterocarpus erinaceus* species.

Item	Amount (₦)	Percentage of total
a. Variable Cost (VC)		
Cost of Labour	89,800	16.9
Cost of Harvesting	91,800	17.2
Cost of Transportation	68.350	12.8
Cost of Processing	281,150	52.9
Total Variable Cost	**431,100**	**100**

Source: Field Survey, 2018

b. Fixed Cost (FC)

Cost of Equipment	15,960,150
Total Fixed Cost	15,960,150
Total Cost (TC) TVC + TFC	16, 391, 250
Total Revenue	**30, 044. 000.**

c. Gross Margin

G.M = Total Revenue (TR) - Total variable Cost (TVC)

Total Revenue = 30, 044,000,000
Total Variable Cost =431, 1000
GM = 30,044,000- 431,100, 100 = ₦29,612, 900

d. Benefit Cost Ratio

$$BCR = \frac{\Sigma Bt\ (1 + r)^t}{\Sigma ct\ (1 + r)^t}$$

$$BCR = \frac{30{,}044{,}000(1 + 0.15)^1}{16{,}391{,}250(1 + 0.15)^1}$$

$$BCR = 2.8$$

Profitability = TR - TC
= 30,044,000-16,391, 250
Profit = ₦13, 652,750

Problems encounter in processing the product of *pterocarpus erinaceus*

From the above table, 59% of the respondents said they have encountered series of problems in processing the products which ranges from bad road, distance from the felling site to the main road, high charge of labour due to the hard nature of the work, pushing from the bush to the road site etc.

Table 3: Problems encounter in processing the product of *pterocarpus erinaceus* in the study area.

Variables	Response	Percentage (%)
Yes	67	59
No	46	41
Total	113	100

Source: Field Survey 2018

V. Conclusion And Recommendations

Conclusion

Nevertheless, *pterocarpus erinaceus* within Taraba state mostly where this tree (*pterocarpus erinaceus*) has a great potentials and prospect irrespective of all odds, the prospects are that there should be availability for the ministry of environment to provide adequate professional forestry services management, availability of market and more importantly the climate condition for management and conservation of the forest Resources. Therefore, there is need for the government to do well by completely create a law for the stoppage of the over exploitation and trading of the *pterocarpus erinaceus*, to forestall the future incidence of commercial exploitation of a particular species or ecosystem, the government should empower the forestry department to fully enforce the forestry laws and policies in Nigeria and Taraba state as well laws to prohibit indiscriminate and illegal felling of *pterocarpus erinaceus* should be enacted and strict penalty on offenders of such law to reduces the menace of such acts.

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