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[Emeka Samuel Anarah](#)^{*} , Adaeze Peace Umeukeje , Ikechukwu Samuel Obiajulu , Nkiru Theresar Meludu , [Akaneye Patrick Obot](#)

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Article

Economics Analysis of Bamboo Marketing in Anambra Agricultural Zone of Anambra State, Nigeria

Anarah, S.E. *, Umeukeje, A.P., Obiajulu, I.S., Meludu N.T. and Obot A. P.

Department of Agricultural Economics and Extension Nnamdi Azikiwe University, Awka, Nigeria

* Correspondence: se.anarah@unizik.edu.ng; Phone: +2347066006598

Abstract: The study examined the economics analysis of bamboo marketing in Anambra Agricultural zone of Anambra State, Nigeria. The study look at the profitability of bamboo marketing in the study area, ascertain the constraint faced by bamboo marketers in the study area and determined the sources of fund, labour and transportation mode in bamboo marketing. Data were collected from 60 respondent who were selected purposively from four major markets in Anambra Agricultural zone using snowball. From each of the four markets in the study area, 10 retailers and 5 wholesalers were selected through Snowball Sampling Method (SBSM) which gave a sample size of 60 respondents (40 retailers and 20 wholesalers). The four major markets in the zone were purposively selected Otuocha market, Oye-Olisa market, Eke-Igwe Nteje market and Oye-Farm market at Igbariam. Data were analyzed using descriptive statistics, gross margin (GM) and 3 points likert scale. 38.6 % of the bamboo marketers in the study area sourced fund from co-operative societies, 30% of the marketer's sourced fund from family members and relatives, 41% of the marketers used their personal bus and truck for transportation of bamboo to either shop or place of request. Majority of respondents hired labour (36.6 %) to harvest bamboo from the forest, 26.6 % use hired and family labour for the harvest. The total revenue generated in bamboo marketing in Anambra Agricultural zone by both wholesalers and retailers were ₦80,500,300 and ₦9,674,054 respectively. High cost of bamboo, high cost of transportation, high demand, poor sales, poor storage facility and bad weather show significance. Bamboo marketers should be encouraged to acquire improved production knowledge through seminars, workshops and field works to build confidence in them, this will increase profit in the area, especially in value chain.

Keywords: Bamboo; Profitability; Marketing; Constraints and Economic

1. Introduction

Bamboo has proven to be a valuable resource worldwide, especially in countries with abundant bamboo resources, such as India, Ethiopia, and Nigeria. In India, bamboo (Botanical name: *Bambusa vulgaris*, Family: Poaceae) is known as "poor man's timber" due to its affordability and versatility. As the second-largest bamboo producer globally, India has approximately 15.69 million hectares of bamboo (FAO, 2014) and produces around 189 million tons yearly (Mengstu et al., 2023). The uses of bamboo range from traditional applications in construction and furniture to emerging uses in biofuel, pulp, and paper production (FAO, 2005).

Similarly, Nigeria possesses extensive bamboo resources in both highland and lowland areas. While the economic benefits of bamboo have been widely recognized in other parts of the world, in Nigeria, bamboo's economic contribution remains underutilized, with its role in rural livelihoods and development still poorly understood. In Nigeria's two main bamboo species, *Bambusa vulgaris* and *Oxystenantha abyssinica*, have shown promise in supporting economic activities, such as the production of load-bearing composite cement panels suitable for construction (Eugene et al., 2014). Bamboo has environmental benefits as well, such as supporting reforestation efforts, reducing deforestation, and mitigating climate change due to its fast growth, high oxygen production, and tensile strength comparable to steel.

1.1. Objectives of the Study

- i. determine the sources of fund, labour and transportation mode in bamboo marketing;
- ii. determine the profitability of bamboo marketing in the study area; and
- iii. ascertain the constraint face by bamboo marketers in the study area

1.2. Review of Related Literature

Bamboo has emerged as a critical resource in various countries due to its economic and environmental benefits. Globally recognized as an industrial raw material, bamboo supports numerous industries. Ladapo et al. (2017) reviewed Nigeria's vast bamboo resources and identified potential applications in construction, biofuel, charcoal production, paper manufacturing, and pharmaceutical industries. Eugene et al. (2014) demonstrated that *Bambusa vulgaris* grown in southeast Nigeria is suitable for creating durable composite cement panels for building structures.

According to the International Network for Bamboo and Rattan (INBAR, 2016), the global export value of bamboo commodities, including furniture, increased from \$2.8 billion in 1995 to \$4.3 billion in 2005, showcasing the growing demand and economic potential of bamboo. Bamboo's primary production occurs in Asia, with China being the largest producer, reinforcing the crop's industrial and commercial significance.

1.3. Study Area

The study focuses on the Anambra Agricultural Zone in Anambra State, Nigeria. This region is agriculturally vibrant, featuring fertile plains, warm tropical climate, and adequate rainfall, making it conducive for bamboo cultivation and marketing. Anambra State, located within Nigeria's Southeast geopolitical zone, is bounded by Kogi State to the north, Imo State to the south, Enugu State to the east, and River Niger and Delta State to the west. Four major markets were selected for this study based on their strategic importance for bamboo trade and accessibility: Otuocha Market, Oye-Olisa Market, Eke-Igwe Nteje Market, and Oye Farm Market.

1.4. Sampling Procedure and Sample Size

Four major markets in the zone were purposively selected Otuocha market, Oye-Olisa market, Eke-Igwe Nteje market and Oye-Farm market at Igbariam. Eke Otuocha market was purposively selected for four major reasons: First, It is more strategically located near River Omambala where it is easily accessed by people of the zone and outside the zone through the river and or roads. Secondly, Otuocha is the headquarters of Anambra East LGA. Thirdly, Eke Otuocha is one of the biggest and good representatives of markets in the zone where bamboo is demanded and supplied, Fourthly Eke Otuocha is closer to the airport for transportation through air. Eke-Igwe Nteje was purposively selected because it is one of the biggest markets in the zone and because Nteje is the headquarters of Oyi LGA. Oye-Olisa Ogbunike was purposively selected because it is one of the biggest assembly markets in Oyi LGA and because Ogbunike is one of the important town communities in Anambra State with important land marks which include a cave and biggest building materials market in the state. The last one (Oye farm) was purposively selected because it is the only farm settlement market of the study area and in Anambra State of Nigeria.

From each of the four markets mentioned in the study area 10 retailers and 5 wholesalers were selected through Snowball Sampling Method (SBSM) which gives a sample size of 60 respondents (40 retailers and 20 wholesalers).

1.5. Data Collection

Primary data were collected using a well- structured questionnaire and interviewed section using two sets of interview schedule (one for the wholesalers and the other for the retailers).

1.6. Data Analysis

Data were analyzed using descriptive statistics, gross margin (GM) and 3 points likert scale

Analysis. **Gross Margin (GM):** Calculated as the difference between total revenue (TR) and total variable costs (TVC) (1)

$$GM = TR - TVC$$

Other variables assessed for the analysis were the: total fixed costs (TFC), total variable costs (TVC), total costs (TC), net return on investment (NROI) and net marketing income (NMI). The **Net Return on Investment (NROI):** Represents the ratio of net marketing income (NMI) to total costs (TC), determining profitability

$$NROI = NMI/TC (2)$$

Net Marketing Income (NMI): Calculated by subtracting total fixed costs (TFC) from the gross margin.

$$NMI = GM - TFC (3)$$

The bamboo marketing enterprise with the highest NROI is deemed the most profitable. The line calculation method was used to calculate the annual depreciation values of bamboo marketing assets. The annual depreciation Values were determined using this mathematical formula:

2. Results And Discussion

Table 1. Respondents' distribution according to sources of fund, labour and transportation mode of bamboo marketing.

Respondent	Frequency	Percentage
Source of fund		
Family members and relatives	18	30.0
Co-operative societies	22	38.6
Micro Finance banks	17	28.3
Commercial banks	3	5.00
Total	60	100
Mode of Transportation		
Personal bus and trucks	25	41.6
Wheel barrow	15	25.0
Motorcycles/Tricycles	10	16.6
Commercial vehicles	10	16.6
Total	60	100
Source of labour		
Family labour	12	20.0
Hired labour	22	36.6
Family & Hired	16	26.6
Community labour	10	16.6
Total	60	100

Source: Field Survey, 2018.

Table 1 shows that 38.6 % of the bamboo marketers in the study area sources fund from co-operative societies, 30% of the marketers sources fund from family members and relatives , 28.3% source fund from micro finance bank and the remaining 5% from commercial banks .

Majority 41% of the marketers use their personal bus and truck for transportation of bamboo to either shop or place of request, while 25% uses wheelbarrow as means of transporting the bamboo to point of delivery in the study area, others 16.6% uses motorcycle and commercial bus as transportation means respectively, which may be very expensive from point of harvest to the shop or place of request.

The majority of respondents were found to utilize hired labour (36.6 %) to harvest bamboo from the forest, 26.6 % use hired and family labour for the harvest, 20 % uses family labour only, it may be to save cost, while the remaining 16 % use community labour.

Table 2. Monthly estimates of the marketing costs and returns of bamboo wholesalers and retailers.

Marketing Variables	Wholesale (₦)	Total cost (%)	Retail (₦)	Total (%)
Variable cost:				
Purchase	3,001,500	21.36	800,220	10.54
Loading	320,500	21.13	92,000	3.33
Transportation	500,000	2.33	79,500	2.81
Security dues	150,500	14.37	432,000	5.26
Off-loading	450,500	13.90	150,000	5.36
Storage	500,000	14.87	200,000	5.73
Total Variable Cost (TVC)	4,923,000	87.96	1,783,720	56.55
Fixed cost:				
Monthly store rent	1,246,600	7.95	300,000	4.00
Association due	400,000	5.86	620,000	4.65
Interest on loan	200,200	2.28	30,500	2.34
Cost of wooden table	675,500	3.27	290,800	5.08
Total Fixed Cost (TFC)	2,522,300	12.0	1,241,300	72.01
Total revenue (TR)	80,500,300		9,674,054	
Total Cost (TC = TVC + TFC)	7,445,300		542,420	
Gross Margin (GM = TR - TVC)	80,008,000		7,890,334	
Net Farm Income (NFI = TR - TC)	793,055,000		9,131,634	
Mean Net Farm Income (NFI = NFI/n)	928,207.1		57,038.9	
Net Return on Investment (NROI = NFI/TC)	0.80		0.61	
OME (TC/TR)	0.130		0.135	

Source: Field Survey, 2018.

2.1. Profitability of Bamboo Marketing

Table 2 shows the profitability of bamboo marketing in Anambra Agricultural zone. A total of **₦4,923,000** was spent by the wholesalers on variable cost alone. The highest amount for wholesale variable cost was spent on purchase at ₦3,001,500 and the lowest amount was spent on security dues of bamboo from vehicles. The total fixed cost was at **₦2,522,300**. The highest amount that was spent on fixed cost is ₦1,246,600 which is on monthly store rent while the lowest amount of ₦400,000 was spent on association due. Also, they spend huge amount of money renting store and on transportation of the bamboo from forest to the location of their shops.

For the retailers, a total of **₦1,783,720** is spent on variable cost. The highest amount spent on any marketing variable is also on purchase of bamboo, and the lowest amount is interest on loan ₦30,500. The total fixed cost is **₦1,241,300**. The highest amount of ₦620,000 is spent on association due, and the lowest is also spent on loan interest at ₦30,500. The total revenue generated in bamboo marketing in Anambra Agricultural zone by both wholesalers and retailers are ₦80,500,300 and ₦9,674,054 with net marketing income of ₦928,207.1 and ₦57,038.9 respectively. This means that bamboo wholesales in the area is highly profitable, this is in agreement with (INBAR 2016) which reveals that domestic market for bamboo and rattan products in major producing countries is estimated very high. The net returns on investment for the wholesalers and retailers are at 0.80 and 0.61 respectively.

Table 3. Constraints of bamboo marketing in Anambra Agricultural Zone.

S/N	Constraints of marketing	bamboo	High	Moderate	Low	\bar{X}	Std.	Sig
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1	Lack of bamboo	24	22	14	4.5	3.16	S
2	High cost of transportation	35	13	12	4.3	3.12	S
3	Post harvest control	14	25	21	2.5	2.96	NS
4	High demand	31	15	14	3.5	2.83	S
5	Poor sales	19	21	20	4.3	2.41	S
6	Labour intensive	21	21	18	2.7	2.16	NS
7	Poor storage facility	11	19	30	4.3	2.04	S
8	Bad weather	19	13	28	3.6	2.03	S

Source: Field Survey, 2018.

2.2. Constraints of Bamboo Marketing in Anambra Agricultural Zone

Table 3 shows constraints of bamboo marketing in Anambra Agricultural zone. The variables identified to be the main constraints are shown by three points likert, high, moderate and low. According to the mean score the decision rule 3.0. The table showed that the constraints as identified by the respondents are high cost of bamboo ($\bar{X} = 4.5$), high cost of transportation ($\bar{X} = 4.3$), poor harvest control bamboo ($\bar{X} = 2.5$), high demand ($\bar{X} = 3.5$), poor sales ($\bar{X} = 4.3$), labour intensive ($\bar{X} = 2.7$), poor storage facility ($\bar{X} = 4.3$) and bad weather ($\bar{X} = 3.6$). High cost of bamboo, high cost of transportation, high demand, poor sales, poor storage facility and bad weather show significance. These agrees with Ogunwusi and Onwualu (2013) whish state that a number of problems are constraining industrial development of bamboo thereby impeding potential of bamboo to generate income and alleviate poverty in developing countries, including Nigeria.

3. Summary of Findings, Conclusion and Recommendations

This chapter summarized the findings of the study, made conclusions based on the findings and recommendations made for further study.

Summary of Findings

38.6 % of the bamboo marketers in the study area sources fund from co-operative societies, 30% of the marketers sources fund from family members and relatives , 28.3% source fund from micro finance bank and the remaining 5% from commercial banks .

Majority 41% of the marketers use their personal bus and truck for transportation of bamboo to either shop or place of request, while 25% uses wheelbarrow as means of transporting the bamboo to point of delivery in the study area, others 16.6% uses motorcycle and commercial bus as transportation means respectively. The majority of respondents were found to utilize hired labour (36.6 %) to harvest bamboo from the forest, 26.6 % use hired and family labour for the harvest, 20 % uses family labour only while the remaining 16 % use community labour.

A total of ₦4,923,000 was spent by the wholesalers on variable cost alone. The highest amount for wholesale variable cost was spent on purchase at ₦3,001,500 and the lowest amount was spent on security dues of bamboo from vehicles. The total fixed cost was at ₦2,522,300.

For the retailers, a total of ₦1,783,720 is spent on variable cost. The highest amount spent on any marketing variable is also on purchase of bamboo, and the lowest amount is interest on loan ₦30,500. The total fixed cost is ₦1,241,300.). High cost of bamboo, high cost of transportation, high demand, poor sales, poor storage facility and bad weather were significance.

4. Conclusions

This study found source of fund, labour and mode of transportation as a major factor considering the marketing of bamboo in the study area. These whole sellers and retailers variables play significant role in the marketing channel of the business in the study area. constraints as identified by the respondents are high cost purchase of bamboo, high cost of transportation , poor harvest control, high demand, poor sales, poor storage facility and bad weather are major constraints face by the bamboo marketers in the study area.

Recommendations

Based on the findings of this study, it is recommended that:

1. Bamboo marketing' should be encouraged to gain knowledge production through seminars, workshops and field works to build confidence in them. This will increase profit in the area, especially in value chain.
2. Government should intervene in the area of transportation by subsidize the price.
3. More value-chain should be thought in bamboo production and marketing in the study area.

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