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PROFITABILITY ANALYSIS OF PROCESSING LOCUST BEAN INTO DADDAWA BY WOMEN IN BAUCHI STATE, NIGERIA

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ABSTRACT

This study analysed the profitability of locust beans processing into daddawa among women in Bauchi State, Nigeria. A multistage sampling procedure was used to select 132 women processors. Descriptive statistics and Net processing income were used in the analysis of the data for this study. The results of the study showed that women locust bean processors had an average age of 44.5 years and a mean household size of 7. The majority (53.4% and 72.52%) of the women processors were married and had formal education respectively. The results also revealed that the total cost of daddawa processing was ₦3, 301.9, and gross revenue of ₦5, 875.0 with a net processing income of ₦2, 073.1, and return per naira invested of ₦0.63. The major constraints associated with locust bean processors into daddawa were time consuming, inadequate capital, and lack of technological know-how. It was concluded that locust beans processing into daddawa was profitable and a viable venture. It is recommended that the adoption of improved methods of processing is imperative, to ensure timely and non-stressful operation.

Keywords: *Locust beans processing, profitability, Daddawa, women*

INTRODUCTION

In many parts of Nigeria, African Locust Beans (ALBS) is a popular delicacy, especially as there is a growing interest in natural food ingredients as additives in consumer diets. The African Locust Beans (*Parkia biglobosa)* is a perennial leguminous tree plant that bears elongated round flowers, which develop into sweet-flavoured yellow-pulpy pods enclosing the seeds (Yusuf and Rhaji, 2012). The tree is often planted by peasant farmers and rural dwellers for its multipurpose benefits. Under the Nigerian edaphic factor, the tree begins flowering from December to May and fruits from February to July depending on the variety (Adejumo, Azeez, Geply, and Oboite, 2013). The seeds are mostly valued products of the tree, they generates reliable and dependable income for the farmers and Women who are involved in its processing and marketing. It is estimated that the total national demand for various types of food condiments and seasoning in Nigeria is 5,475 tonnes per annum (Federal Institute of Industrial Research Oshodi (FIIRO), 2013).

Yusuf and Rhaji (2012) stated that there are two species of African Locust Beans (ALB) in Nigeria; these are *Parkia* biocolor and *Parika* biglobosa. Both are locally processed in Nigeria and used to prepare spices or food ingredients, otherwise called *iru* in Yoruba, *daddawa* in the Hausa language, and *ogiri/okpeyi* in Igbo. This study adopts the name *daddawa*. *Daddawa* is a protein-rich and tasty seasoning used as stock cubes for spicing and enhancing the taste. According to Babalola (2012), *P. biglobosa* has important socio-economic and cultural values especially for local folks which include, therapeutic, nutritional and domestic energy values. Therefore, a wide cross-section of rural communities gets involved in the production as well as consumption of its bean regardless of age, sex, educational background, or religious affiliation.

Pokia biglobosa processing is a sector that offers great promise for women to enhance their effectiveness for the greater good (IIDS, 2019.). According to Nwapkadolu and Nwareji (2016), locust bean processing involves cleaning, de-hulling, washing, boiling, separating, and fermenting the cotyledon, and finally mashing to obtain a valuable product that meets the taste of the consumers.

In Bauchi State, locust bean processing serves as a means of livelihood for rural women. The majority of rural women in the State earn a living through engagement in agro-processing business enterprises. They earn personal income through engagement in the processing of locust bean seed into Daddawa, and cater for their household through the profit they make from the business. The prevailing method of processing African Locust Beans in the study area is manual or traditional. Therefore, this study aimed to ascertain the profitability level of locust bean processing among women in Bauch State.

METHODOLOGY

The Study Area

The study was carried out in Bauchi State. The administrative headquarters and the State capital fall within the central part of Bauchi State which is the Bauchi Local Government area. The population of Bauchi L.G.A. is 593,810 with an annual growth rate of 3.2% (NPC, 2006). Bauchi metropolis apart from being the state capital and the headquarters of the Local Government, is also the main urban as well as the main business Centre of the state. The State is divided into three agricultural zones namely Central, Northern and Western zone.

Sampling Technique and Sample Size

A multistage sampling technique was used for the collection of data in the study area. Banchi State has three (3) Agricultural zones and all three zones were considered. The first stage involved the selection of two LGAs from each zone based on the concentration of locust bean processors. On that basis Dambam, Warji, Gamawa, Giade, Kirfi and Dass were selected. The second stage was a purposive selection of one known cluster (in Districts/wards of women processors from each of the six LGAs. which comprises Jalam, Boimai, Gadiya, Bambiyo, Lariski, and Durr). In the third stage, a pre-survey was conducted and found two hundred (200) women locust bean seed processors in six LGAs. Therefore, using the Krejcie and Morgan sample size Table, 132 women locust bean processors were selected randomly.

Method of Data Collection and Analysis

The main source of data for this study was primary data. Data were collected through a field survey of *daddawa* processors using a well-structured questionnaire, with the help of trained enumerators. Descriptive statistics and net processing income were used to analyze the data to achieve the objective of this study.

Descriptive statistics: Descriptive statistics such as frequency, percentage, and mean were used to describe the socioeconomic characteristics of women locust bean processors and the constraints associated with locust bean processing into *daddawa.*

Net Processing Income: The expenses incurred in naira by each processor during processing activity consist of both fixed and variable costs (Olukosi and Isitor 2005).

$$NPI = TR - TC \quad \ldots\ldots (1)$$

And $TC = TVC + TFC$ ..... (2)

Where

NPI = Net Processing Income of *Daddawa* (₦)

TR = Total Revenue generated by *Daddawa* processor (₦)

TC = Total Cost of *Daddawa* Processing (₦)

TVC= Total Variable Costs of inputs such as locust bean seed, water, firewood, hired labour, household labour, potash/salt and transportation.

TFC = Total Fixed Costs (Depreciation) value of implements used in *Daddawa* processing. It is expressed as:

$$D = \frac{P - S}{N} \quad \ldots\ldots (3)$$

Where:

D = Depreciation on Daddawa Processing implements

P = Original Costs of Daddawa processing Implements

S = Salvage Value of the implements

N = Number of Years of Assets Life

The fixed cost components were:

Knives, sieves, jute bags, buckets, calabash, spaying mats and trays

While the variable cost components are:

Hired labour, household labour, locust bean seed, water, firewood, transport, potash/sal

Gross ratio/Operation ratio/Fixed ratio

To determine the profitability of processed *daddawa* some will be calculated, According to Olukosi and Erhabor (2005). The following Formula is used

$$GR = \frac{TC}{GI} \quad \ldots\ldots(4)$$

Where:

GR = Gross ratio

TC = Total Cost of *daddawa* processing

GI = Gross Income generated from processed *daddawa*

A value of less than one (< 1) is desirable for the business. The lower the ratio, the higher the return per naira invested. A value greater than one (>1) is disastrous for any set of business.

$$OR = \frac{TVC}{GI} \quad \ldots\ldots(5)$$

Where:

OR = Operation Ratio

TVC = Total Variable Costs of inputs used in processing *Daddawa*

GI = Gross Income generated from processed *Daddawa*

Operation ratio of one means the gross income barely covers the expenses on variable costs, operation ratio of less than (<1) is desirable

$$FR = TC/GI \quad \ldots\ldots(6)$$

Where:

FR = Fixed Ratio

TPC = Total processing Expenses of variable and Fixed implements used (₦)

GI = Gross Income generated from processed *daddawa* (₦)

If the Fixed ratio is closed to one, it means some of the fixed costs or inputs are either left idle or underutilized.

Returns per Naira Invested

$$RPI = \frac{NPI}{TC} \quad \ldots\ldots(7)$$

Where:

RFI = Returns Per Naira Invested/ Kwano (measurement)

NPI = Net Processing Income (₦)

TC = Total Costs of input used (₦)

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Locust Bean Seed Processors

The socio-economic characteristics considered in this study were quantitative - age, household size and years of processing experience, sex, educational level, and marital status of locust bean seed processors. The results in Table 1 revealed that the mean age was 44.5 years. This showed that the processors were active, strong, and agile and could participate adequately in processing activities. This finding slightly disagrees with Forayola, Okpodu, and Oni (2012) who found that respondents were within the age range of 21-40 years and were considered to be young, agile, and active in the production and marketing of *daddawa,* therefore capable of the tasks involved in the enterprises

Table 1: Distribution of Socio-Economic Characteristics of the Respondents

Variables	Freq	%	Mean	Std Deviation	Minimum	Maximum
Age (years)						
20-29	7	5.3	44.5	9.59	21	69
30-39	30	22.9				
40-49	55	42.0				
50-59	26	19.8				
60-69	13	9.9				
Household Size (No)						
1- 3	29	22.1	7	2.44	1	14
4- 6	43	32.8				
7- 9	21	16.0				
10-12	34	26.0				
13- 15	4	3.1				
Experience (Years)						
1-5	11	8.4	13	12.44	1	25
6-10	32	24.4				
11-15	44	33.6				
16-20	24	18.3				
21-25	20	15.3				

Source: Field survey (2021).

The results also showed that the average household size was 7, implying that there may be an appreciable number of family labour supply to accomplish various processing operations if all family members were to actively participate in processing operations. The results further show that the majority (76.3%) of locust bean seed processors had 6-20 years of experience with an average of 13 years. This implied that the majority of the processors were relatively old in locust bean seed processing.

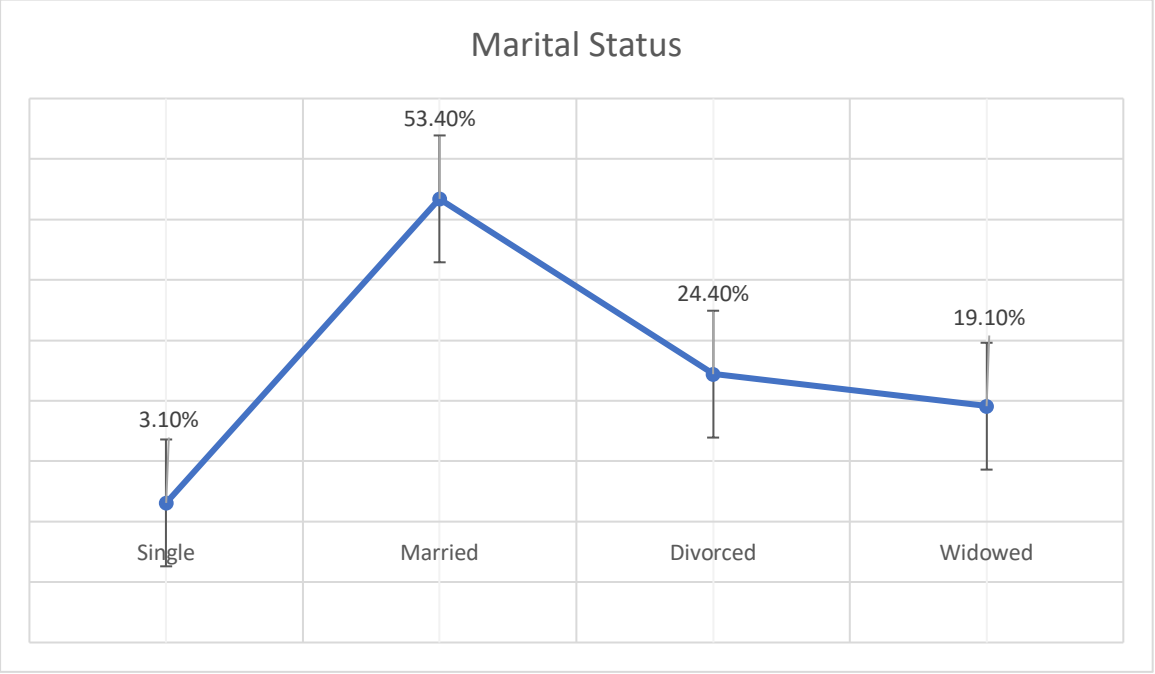
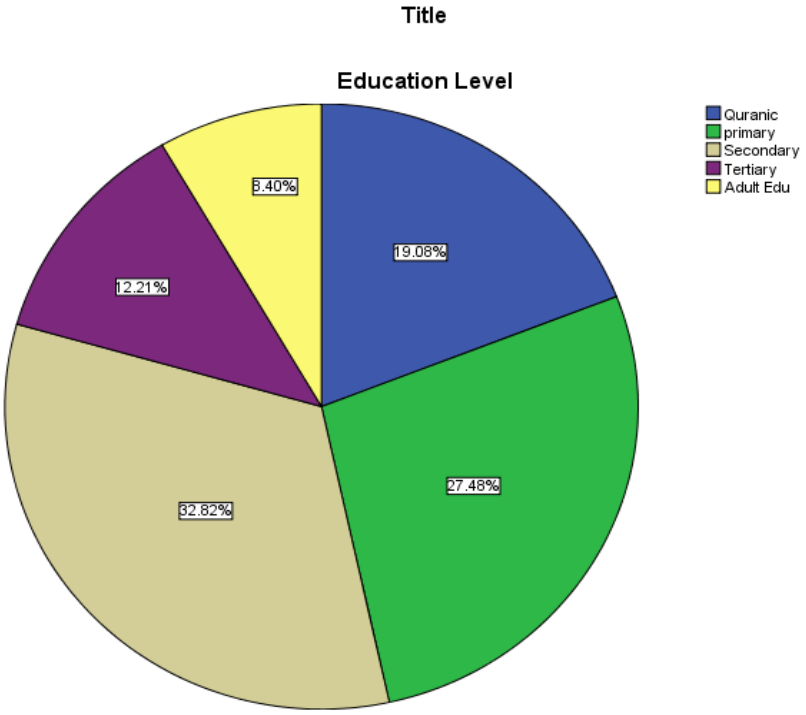


Figure 1: Marital status of locust bean seed processors

The results in Figure 1 showed that the majority of the processors (53.4%) were married, while the minority of (3.1%) of the processors were single. The culture of the study area allows women to marry at younger age of 16 years or less than that, this is why the majority of the processors are married with children.



Source: Field survey (2021)

Figure 2: Educational level of the locust bean processors

The results in Figure 2, showed that most of 32.82% of locust bean seeds processors had primary education, 27.5% of the respondents had only Qura'nic education, and 8.4% minimum of adult education. This indicated that the processors' educational level was above average. This high literacy proportion of locust bean seed processors in the study area implied that the processors would be better exposed to more reliable information sources and good decision making in their processing activities.

Profitability of Locust Bean Processing into *Daddawa*

Information was collected on the various costs incurred in the processing of locust beans and the cost incurred on transportation. These costs outlay are referred to as processing costs. The processors provided information on the transactions they undertook during the processing period. On average, the quantity purchased varied remarkably across the various categories of locust bean seed processors in Bauchi State. See Table 2.

The results in Table 2 revealed that most (36%) of the processing cost was hired labour, while other processing costs represented the least components such as tray, knife, and jute bag costs, accounting for 3% of the total processing cost.

Table 2: Costs and Return of *Daddawa* (₦/kg)

Variables amount (₦)	Total	TVC %	TC%
Variable cost			
Locust bean seed Cost (N/kg)	588.4	28	21.4
Household labour	500	11	12.0
Hired labour	750	36	27.3
Water	2.5	0.7	1.0
Firewood	500	9.6	7.2
Potash/salt	80	3.0	2.3
Transportation	146	7.0	5.2
Total Variable costs	**2566.9**	**100%**	
Fixed cost		**TFC%**	
Mat/tarpaulin	114	17.0	5.2
Pot	214	32.5	7.3
Calabash	80	7.0	1.2
Bucket	85	12.0	3.0
Tray	20	3.0	0.5
Jute bag	30	3.0	0.6
Knife	14	3.0	0.4
Pestle& mortar	148	22.5	5.3
Total Fixed Cost	**735**	**100%**	**100%**
Total processing Cost(₦)	**3301.9**		
Total Revenue (₦)	**5875.0**		
Net processing Income(₦)	**2073.1**		
Gross Ration	**0.14**		
Operating Ratio	**0.61**		
Fixed Ratio	**0.64**		
Return on Capital Invested	**0.63**		

Source: Field survey (2021).

The results of the net processing income of *daddawa* sold per week in kg showed that the enterprise was viable. It was observed that the mean weight of 1.5 mudu (measurement) of locust bean seeds weighed 1kg. The average selling price for a kg of *daddawa* was ₦5875.0 while the average processing cost was ₦3301.9. The mean processing returns made by the *daddawa* processors per kg was ₦2073.1. The results revealed that locust bean seeds purchase price cost accounted for 28% of the total cost while the cost of transportation accounted for 7.0. The results also showed that the cost of both labour gulped 52% of the total cost while pot accounted for 32.5% of the total cost. The average rate of return on investment (return per naira invested) was ₦0.63, indicating that for every ₦1 invested in locust bean seed processing in Bauchi State, a profit of 63 kobo was made. The low processing charges among the processors may be due to the fact that most of them hawk or sell in open spaces, along the road, and mostly at home without paying for rent, utility advertisement, and tax making the business profitable

and return per Naira invested to be high compared with other customized close substitutes such as knorr, Maggi, Ajinomoto.

Constraints Associated with Locus Bean Seed Processing

In Table 3, the constraints associated with locust bean seed processing in Bauchi State are presented. The constraints associated with *daddawa* processing in the study are ranked in Table 3. The results revealed that 100% inadequate modern processing technology and time consuming/strenuous was ranked 1st as the most influential constraint associated with daddawa processors in Bauchi State. This may be unconnected with the fact that the processing of locust bean seed is done manually and traditionally without using machines, this may tend to increase the period of processing and demand for much labour to accomplish the task.

Table 3: Constraints of *Daddawa* Processing in Bauchi State

Constraints	Frequency	Percentage	Rank
Time consuming/strenuous	131	100	1st
Modern processing tech.	131	100	1st
Inadequate capital	125	95.4	2nd
Technical know-how	113	86.3	3rd
Poor and unstable market	111	84.7	4th
Poor Packaging/storage facilities	108	82.4	5th
High cost of ALBS	102	77.9	6th
Inadequate Market	81	64.8	7th
Availability of ALBS	71	54.2	8th
Low/decreasing price	33	25.2	9th
Social stigmatization	29	22.1	10th

Source: Field survey (2021)

The result further revealed that 95.4% inadequate capital and 86.3% technical know-how were ranked 2nd and 3rd respectively. The locust bean seed processors are inclined to the religion and culture of the area where women depended solely on their spouse's income and only 32% have access to loans while the majority of them either inherited the business or grew up and met the business their family without under-going training or have contact with an extension agent. The least constraint associated with processors in the study area is social stigmatization with 22.1%. *Daddawa* has important socio-economic, cultural, and nutritional values, therefore, a wide cross-section of rural communities gets involved in its production and consumption regardless of age, sex, educational background, and religious affiliation.

CONCLUSION AND RECOMMENDATION

Based on the findings of the study, it is sufficed to conclude that locust bean seed processing in Bauchi State was a viable enterprise. It is recommended that the rural women locust bean seed processors package their product very well so that they will be able to market their product in supermarkets and bigger shops in order to sell at higher prices to increase their income and *Daddawa* processing is done by manual and tradition method of processing, there is need to adopt improved methods of processing to ensure timely and non-stressful operation.

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