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VALUE ADDITION ANALYSIS OF LOCUST BEANS (PARKIA BIGLOBOSA) IN AKOKO NORTHWEST LOCAL GOVERNMENT AREA OF ONDO STATE, NIGERIA

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ABSTRACT

The study investigated the value addition of locust beans in Akoko Northwest LGA of Ondo State. Primary data were collected for the study and a multi-stage sampling technique was employed to select the respondents using a well-structured questionnaire. Descriptive statistics and gross margin analysis were employed to analyse the data. The result revealed that majority (60.00%) and (66.70%) of the producers and processors respectively were above 50 years of age, whereas about 90.00% of the marketers were below 50 years of age. Similarly, majority (91.10%) of the respondents were married female with about 75.60% having one form of education or the other. The producers made an average net income of ₦21,843.97 at a selling price of ₦635.24 while the processor made a net income of ₦16,648.02 at a selling price of ₦946.90 per kg and the marketer made a net income of ₦22,950.00 at a selling price of ₦1,200.00 per kg. This implies that while a producer made a gain of 52 kobo on every ₦1 invested in the business, the processor and marketer made 21 and 24 kobo respectively on every ₦1 invested in the business in the area. Result further revealed that while lack of modern technology was the first and most severe problem of the producers, lack of capital was attested to be the most militating problem of the processors and lack of organised market was the most militating challenge of the marketers.

Keywords: Value Addition, Locust Beans, Costs, Returns, Gross Margin, Nigeria.

INTRODUCTION

African locust bean (*Parkia biglobosa*) is a member of the leguminosae family normally found around the tropics and several towns in the savannah territories of West Africa especially in the Middle Belt and South Western area of Nigeria. It is a perennial tree legume which produces fruits from December to March and harvested in April - May with many leguminous pods each with a tough pericarp. The tree has a height ranging from 7 to 20 m and in some exceptional cases some might reach heights of about 30 m, with a wide spreading umbrella-shaped crown (Teklehaimanot, 2004; Ojewumi, Omoleye and Ajayi, 2016). It can start to bear fruits from five to seven years after planting (Musa, 1991). The most important use of African locust bean is found in its seed, which is a grain legume, although it has other food and non - food uses, especially the seeds which serves as a source of useful ingredients (food condiment) for consumption (Campbell-platt, 1980). The husks and pods also serve as good food for livestock (Douglass 1996; Eka, 1980). Though efforts have been made to scientifically study the traditional processing, marketing, physical and chemical changes, as well as the micro-organisms involved in the processing of African locust bean by Campbell-Platt, (1980), Odunfa, (1981), and Babalola, (2012), there is still much to be done in the area of value addition of the produce. However, since the people of Akoko Northwest Local Government Area are not only known to depend on locust beans "Iru" for their household delicacies over the years but are also seen as the major producers and processors of the product in Ondo State, it is of paramount importance and worthwhile to carry out a study that would eventually improve the processing and utilization of the product in the area.

Value addition to agricultural products is the process of increasing the economic value and consumer satisfaction of an agricultural commodity (Babalola, 2012). Various value-adding technologies include processing and preservation techniques, dehydration and drying technology, fermentation, labelling, packaging and branding (Babalola, 2012; Adedokun, 2006). The turnover plus income from services over the cost of bought-in of materials and services are termed as gross value added (Adejumo, 2008). The annual charge of depreciation on the remainder is called net value-added. Furthermore, the excess of turnover plus the income from services over cost of bought-in of materials and services is termed value added and the annual charge of depreciation is known as an application of value added available to the owners of the enterprise in the form of retained earnings (Adejumo, 2008).

Objectives of the Study

The research aims at assessing the value addition of locust beans in Akoko North West Local Government Area of Ondo State, Nigeria.

The specific objectives are to;

i. describe the socio- economic characteristics of locust beans value addition actors in the study area.
ii. determine costs and returns to value added locust bean in the study area.
iii. identify the major constraints to locust beans value addition in the study area.

RESEARCH METHODOLOGY

Study Area

Akoko Northwest is one of the eighteen Local Governments that made up Ondo State in the Southwest Region of Nigeria. It falls within latitudes 7°30′ and 7°35′N and longitudes 5°43′ and 5°49′E. The climate can be said to be subequatorial with two peaks of rainfall. The first peak comes up between April and July while the second peak comes up between late August and late October. These two peaks are marked by heavy rainfall and the mean annual rainfall

is 1500 – 2000 mm with a relative humidity of about 75 - 95%. Since the climate is sub – equatorial, temperature could sometimes be severe. The mean annual temperature is 23 - 26°C (Adejumo, 2008). Agriculture is the major occupation in the area.

Data and Sampling Techniques

Primary data was used generally for the study while multistage sampling technique was employed to select respondents for the study. The first stage involved purposive selection of 6 towns, namely, Arigidi, Ibaham, Iyani, Ikaram, Iye and Asa in the local government area. The towns were chosen based on the prominence of locust beans in the areas. The second stage involve the selection of 5 producers, 5 processors and 5 marketers in each of the towns (communities) making a total of 90 respondents in all.

Methods of Data Analysis

Data collected were subjected to descriptive statistics and budgetary analysis. Descriptive statistics such as frequency distribution, means, charts and percentages were used to analyse the socio-economic characteristics of the respondents. Budgetary (Gross margin) analysis was used to evaluate costs and returns on locust beans enterprise by the respondents.

Gross margin will be mathematically expressed as:

$$GM = PQ - \sum_{j=1}^{m} C_j X_j$$

Where; GM = Farm Gross Margin, P = Market price of output / kg, Q = Quantity of output produced, processed or sold by ith locust bean value addition actor, Cj = Unit price of the variable input j incurred by ith locust bean value addition actor, Xj = Quantity of variable inputs j used by ith locust bean value addition actor, m = Number of variable inputs used by ith locust bean value addition actor.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Actors in Locust Beans Value addition

Table 1 display the frequency and percentage distributions of socio-economic characteristics of actors in locust beans value addition in the study area. The result revealed that majority (60.00%) and 66.70% of the producers and processors respectively were above 50 years of age, whereas about 90.00% of the marketers were below 50 years of age. This implies that the marketers were younger and likely to be more economically active than the producers and processors in the business. Similarly, majority (91.10%) of the respondents were married female with 6 and 10 household members. This implies that locust bean business is a female gender enterprise with available family labour for their business in the area. Also, majority (75.60%) of the respondents had one form of education or the other. This, however, indicated that majority of the respondents were educated and will be ready to accept new innovations on the business when introduced to them. The result revealed that majority (88.89%) of the respondents were highly experienced with over 5 years' experience in the business. It also indicated that only 26.7% of the respondents had access to credit while majority (68.9%) were not visited by extension agents on the business. These however suggests that many of the actors will depend on their personal savings in financing the business and also lack innovative information on locust beans venture in the study area.

Table 1
Socio-Economic Characteristics of Actors in Locust Beans Value Addition

Actors	Producer		Processor		Marketer		Total Pooled	
Variables	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Age								
≤30	4	13.3	4	13.3	2	6.7	10	11.1
31 – 50	8	26.7	6	20	25	83.3	39	43.3
51 – 70	14	46.7	14	46.7	2	6.7	30	33.3
≥70	4	13.3	6	20	1	3.3	11	12.2
Gender								
Male	1	3.3	6	20	1	3.3	8	8.9
Female	29	96.7	24	80	29	96.7	82	91.1
Total	30	100	30	100	30	100	90	100.0
Marital status								
Single	4	13.3	2	6.7	2	6.7	6	6.7
Married	26	86.7	28	93.3	28	93.3	82	91.1
Household size								
≤5	12	40	7	23.3	8	26.7	27	30.0
6-10	14	46.7	20	66.7	20	66.7	54	60.0
≥11	4	13.3	3	10	2	6.7	9	10.0
Educational status								
No formal education	10	33.3	3	10	9	30.0	22	24.4
Primary school education	8	26.7	23	76.7	3	10.0	34	37.8
Secondary school education	12	40.0	4	13.3	16	53.3	32	35.6
Tertiary school education	8	26.7	0	0	2	6.7	10	11.1
Experience (year)								
≤ 5	4	13.3	3	10	3	10	10	11.11
≤ 6 – 10	19	63.33	10	33.33	17	56.67	46	51.11
11- 15	3	10	11	36.7	6	20	20	22.22
≥ 15	4	13.3	6	20	4	13.33	14	15.56
Access to credit								
Yes	17	56.7	3	10	4	13.3	24	26.7
No	13	43.3	27	90	26	86.7	66	73.3
Belong to Association								
No	15	50	27	90	22	73.3	64	71.1
Yes	15	50	3	10	8	26.7	26	28.9
Extension agent visitation								
Yes	17	56.7	4	13.3	7	23.3	28	31.1
No	13	43.3	26	86.7	23	73.3	62	68.9
Total	**30**	**100**	**30**	**100**	**30**	**100.0**	**90**	**100.0**

Source: Field survey, 2020

Figure 1 depicts the steps involved in the processing of edible locust beans from the fruit to the final products. The whole processes are done through traditional methods and it takes an average of 9 days to complete the process. The processing site is always noticed with an unpleasant odour with dark liquid mixed with water. The edible locust is always preserved with salt and packed in a container. It is normally sold using plantain/banana leaves but the technology has improved, marketers are now repacking the product using nylon and

transparent plastic containers instead of leaves. The final products are sold in different sizes depending on the quantity requested by the consumers. Locust beans (Iru) forms one of the main soup ingredients in the study area. It is sometime used as proxy to meat, and without it the soup is incomplete.

Steps in production of African locust beans to final edible product

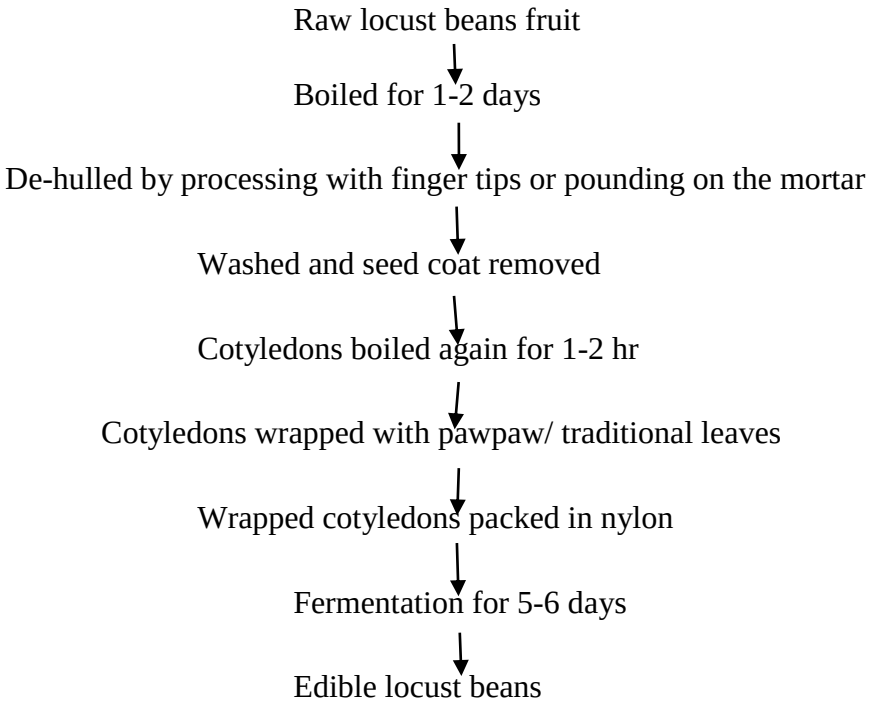

Figure1: Channels in the Production of Edible Locust Beans
Source: Field survey, 2020

Cost and Returns to Locust Beans Producers in the study Area

Table 2 presents the cost and returns to locust beans producers in the study area. The producer made an average net income of ₦21,843.97 at a selling price of ₦635.24 with a capital turnover of 1.52. This implies that a producer will make a gain of 52 kobo on every ₦1 invested on locust beans business in the area.

Table 2
Cost and Returns to Locust Beans Producers

Items	Average Cost (₦)	Percentage
Variable items		
Cost of harvesting	8,880.78	21.3
Cost of packing	4,698.95	11.3
Cost of boiling	3,641.39	8.7
Cost of de-hulling	3,016.18	7.2
Cost of washing and seed coat removal	2,733.61	6.6
Cost of wrapping in paper	2,483.14	6.0
Cost of wrapping nylon	2,043.14	4.9
Cost of fermentation and packaging	2,530.25	6.1
Cost of sales promotion	3,960.71	9.5
Total Variable Cost (TVC)	**33,988.15**	**81.5**
Fixed items		
Depreciated cost of bucket	1,943.33	4.7

Items	Average Cost (₦)	Percentage
Variable items		
Depreciated cost of steamer/pot	4,508.62	10.8
Depreciated cost of sieves	1,240	3.0
Total Fixed Cost (TFC)	**7,691.95**	**18.5**
Total Cost (TC)	**41,680.10**	**100.0**
Revenue		
Producers unit price (P) per kg	635.24	
Average quantity sold = 100kg		
Total revenue	63,524.07	
Net income	21,843.97	
Capital turnover (TR/TC)	**1.52**	

Source: Field survey, 2020

Cost and Returns to Locust Beans Processor

Table 3 presents the cost and returns to locust beans processors in the study area. The result revealed that the processor made a net income of ₦16,648.02 at a selling price (processor price) of ₦946.90 per kg and a capital turnover of 1.21. This implies that a processor will make a profit of 21 kobo on every ₦1 invested in the business in the area.

Table 3

Cost and Returns to Locust Beans Processor

Items	Average cost (₦)	Percentage
Variable items		
Cost of unprocessed locust beans	48965.52	62.74
Cost of boiling	6909.62	8.85
Cost of de-hulling	4128.65	5.29
Cost of washing and removal of seed coat	4582.21	5.87
Cost of winnowing	4208.65	5.39
Cost of packaging	2799.04	3.59
Total variable cost	**71589.69**	**91.73**
Fixed items		
Depreciated cost of bucket	1943.33	2.49
Depreciated cost of steamer/pot	4508.62	5.78
Total fixed cost	**6451.95**	8.27
Total cost (TC)	**78,041.64**	**100**
Revenue		
Processors unit price (P) per kg	946.90	
Average quantity (Q) sold in kg = 100kg		
Total Revenue (P x Q)	94,689.66	
Net income (TR – TC)	16,648.02	
Capital turnover (TR/TC)	**1.21**	

Source: Field survey, 2020

Cost and Returns to Locust Beans Marketer

Table 4 presents the cost and returns to locust beans marketers in the study area. The result revealed that the marketer made a net income of ₦22,950.00 at a selling price (marketer price) of ₦1,200.00 per kg and a capital turnover of 1.24. This implies that a marketer will make a profit of 24 kobo on every ₦1 invested in the business in the area. Comparatively, the three

results indicated that the selling price of each category of the actors defers with the producers having the highest capital turnover of 1.52.

Table 4
Cost and Returns to Locust Beans Marketers

Items	**Average cost (₦)**	**Percentage**
Variable items		
Purchasing cost	88,000.00	90.67
Cost of family labour for miscellaneous operation	1200.00	1.24
Cost of storage	1400.00	1.44
Cost of transportation	1,600.00	1.65
Cost of packaging	1,500.00	1.55
Total Variable Cost (TVC)	**93,700.00**	**96.55**
Fixed items		
Depreciated cost of bucket	850.00	0.88
Depreciated cost of sealing machine	2,500.00	2.57
Total fixed cost (TFC)	**3,350.00**	**3.45**
Total cost (TC)	**97,050.00**	**100**
Revenue		
Marketers unit price (P) per kg	1,200.00	
Average quantity (Q) sold in kg = 100kg		
Total revenue (TR) = (P x Q)	120,000.00	
Gross margin (TR – TVC)	26,300.00	
Net income	22,950.00	
Capital turnover (TR/TC)	1.24	

Source: Field survey, 2020

Constraints Facing Locust Bean Actors (Producers, Processors and Marketers)

Table 5 depicts the distribution of locust bean actors by major constraints in the study area. Result revealed that lack of modern technology which was the first and most severe problem of the producers and which constituted the 4th constraints of the processor did not affect the marketer's category. Similarly, lack of capital which was attested to be the most militating problem of the processors, was the 3rd and 4th problems of the producers and marketers respectively. Poor storage facility was regarded as the 2nd most militating problems of both the processors and marketers of locust bean in the area whereas the problem of lack of organised market which was considered as the most militating challenge of the marketers does not affect neither the producer nor the processor actor.

Table 5
Constraints Facing Locust Bean Actors in the Study Area.

Actors	**Producer**		**Processor**		**Marketer**	
Variables	Mean	Ranking	Mean	Ranking	Mean	Ranking
Lack of modern technology	2.67	1st	2.21	4th	-	-
Climatic/ environmental problem	2.54	2nd	-	-	-	-
Lack of capital	2.41	3rd	2.8	1st	2.34	4th

Actors	Producer		Processor		Marketer	
Poor storage facility	2.39	4th	2.27	2nd	2.55	2nd
High cost of labour	2.37	5th	2.13	5th	-	-
High cost of transportation	2.33	6th	2.10	6th	-	-
High cost of machine	2.14	7th	2.23	3rd	-	-
Lack of organised market	-	-	-	-	13.21	1st
Lack of sales promoter	-	-	-	-	2.48	3rd

Source: Field survey, 2020

CONCLUSION

The study investigated the value addition of locust beans in Akoko Northwest Local Government Area of Ondo State, Nigeria. Result of analysed data from the 3 actors involved in the business indicated that majority of the actors were educated, married female with many years of experience and household size. The business had been proved to be profitable with the producers having the greatest benefit of capital turnover of 1.52 followed by the marketers who had a capital turnover of 1.24. The processors made the least financial benefit of 1.21 capital turnover in the business. It is also concluded that the degree at which the identified constraints such as lack of modern technology, lack of capital, poor storage facilities and lack of organized markets affects the actors defers from one category of the actor to the other.

Recommendations

The study recommends policies interventions that will promote quality locust bean production, equipping extension agents with the necessary materials that will stimulate extension education of the locust bean actors as well as provision of soft loans at reduced interest rate for locust bean actors. Training and retraining of practicing and intending locust bean actors is also recommended.

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