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Economic Analysis of Yam Processing in Oyo State

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Abstract
The study examined the economics analysis of yam processing in Oyo state. Multi-stage sampling technique was used to select the respondents for the study. Primary data were collected with the aid of questionnaire and analyzed using descriptive statistics, profitability and budgetary analysis. The result of the study shows that majority of the respondents were female(70.8%) within the age bracket of 41-60(52.5%).Most of them are married(90%)with primary education(34.2%) and household size of 6-12(74.2%).The study identified two yam products and the various steps in the production of the two products.The profitability analysis shows a net return of 6000 naira per 250kg of yam processed into yam flour which is the major product of yam processing in the area.0.38 rate of return was realized from 250kg bag of yam which implies 38k returns on one naira spent investment. A gross ratio of 0.73 was also recorded and this implies the business is profitable. Factors such as climate change, inadequate credit facilities, poor road network among others are major factors that hinder the processing activities in the area. The study therefore recommends that government should construct feeder roads, provide processing facilities and proper storage facilities to the processors to improve their production and enhance food security.
Keywords: yam processing, profitability, yam products, gross ratio

1 Introduction

Yams (*Dioscorea spp.*) are annual or perennial tuber-bearing and climbing plants with over 600 species out of which six are economically important in terms of food and medicine (IITA, 2009). Yam belongs to the genus "*Dioscorea*" and family "*Dioscoreaceae*". It is an important tuber crop of the tropics. Yam is a tropical crop with many species, which originated in South East Asia and was brought to West Africa in the 16th century. It is one of the principal tuber crops in the Nigeria economy, in terms of land under cultivation and in the volume and value of production (Bamire and Amujoyegbe, 2005). Yams are grown on 5 million hectares in about 47 countries of the world with Nigeria as the leading world producer (FAO 2005 and IITA 2009). In 2005, 48.7 million tons of yams were produced in the world and 97% of these were in Sub-Saharan Africa, which accounts for 70% of world production grown on 2.83 million hectares of land (CGIAR, 2009 and IITA, 2009). Nigeria's yam production was 34 million tonnes in 2005 and by 2006 this increased by 8% to 36.7 million tonnes. Yams are agronomically annual rain fed crops which grow for 6-12 months depending on the cultivar, ecology and soil properties in the production area (NRCR, 1998). They serve as staple food in many tropical and even sub-tropical countries of the world. World yam production amounts to 30 million tonnes annually and 90% are grown in the yam production regions of West Africa (FAO 2002).

Yam is among the oldest recorded food crops and ranks second after cassava in supply of starch in West Africa (Nweke *et al*., 1991). Naturally, yam is rich in starch and produces energy. Yam tubers grow up to 2.5m (8.2ft) in length and weigh up to 70kg (154lb) it has a tough stem which softens after heating. Yam is an important source of carbohydrate for many people of the Sub Saharan region especially in the yam zones of West Africa. It's the second most important tuber crop in Africa, after cassava root, with production reaching above one third of the level of cassava (FAO, 2002). Yam tuber is essentially a starchy food, its principal nutritional function being the supply of calories to the body (Onwueme, 2001). This characteristic contributes to the sustaining of food supply, especially in the scarcity periods at the start of the wet season.

2.Yam Processing

Yam flour is traditionally processed by peeling, sometimes slicing parboiling in hot water (65 ^{0}C) for varied time followed by steeping for 13-24 hours by sun drying to give a dry yam which is milled into flour 'Elubo'. The flour is used in making a thick paste by stirring it in boiling water to produce a product known as 'Amala', which is eaten with stew by the consumer (Babajide *et al;* 2006).Industrial processing and utilization of yam includes starch, poultry and livestock feed, production of yam flour and instant-pounded yam flour production. Traditionally, the processing of pounded yam using pestle and mortar is highly valued but is gradually being replaced in the market with instant-pounded yam flour. Instant pounded yam flour requires short processing time and less energy.(Komolafe and Akinoso, 2005).

Processed yam can be easily stored for a long period (12 - 18 months) if absence of moisture (IITA,2003); hence yam is commonly processed into varying form such as yam flour, poundo yam flour, flakes,

starch, chips etc. using different method of processing.In recent years, much attention has been drawn to the quality of dehydrated food product obtained through yam processing.The lack of quality consciousness by the producers and sellers is astonishing, considering the fact that processed yam of various forms is a major staple food in the country, there are many export opportunities for Nigerian products to countries in the West African sub- region. (Philips et al, 2004). Yam flour is one of the Nigerian Food products which could be exported if produced and displayed in a more hygienic condition. Thus the result from this study will help, provide information to yam processors, food processors, marketers to give insight information on yam processing into various forms.

The general objective of this study is to assess the socio economic analysis of value chains in yam processing in Oyo state. The specific objectives are

- To examine the socio economic characteristics of respondents.
- To identify the various steps involved in yam processing in the study area.
- To determine the profitability of yam processing in the study area.
- To identify problems associated with yam processing in the area.

3.Methodology

3.1 Study Area

The study area was carried out in Saki which falls in Oyo North senatorial district of Oyo State. . It has an area of 2,014 km² and a population of 278,002 at the 2006 census. Saki town lies near the source of the Ofiki River, the chief tributary of the Ogun river, about 40 miles (60 km) from the Benin border. It is referred to as the food basket of Oyo State because of its agricultural activities. It is the headquarters of SakiWest local government authority.

3.2 Sampling Technique.

Multi stage sampling technique was employed in the study. There is purposive selection of one senatorial district out of the three senatorial district in Oyo State. Oyo North senatorial district was selected because of the abundance of yam and yam processors in the area. Out of the thirteen local government area in the district, two local governments where there are abundance yam production and processing were selected. They are saki west local government and saki east local government. Three processing centres were selected in each local government and twenty questionnaires were administered in each processing centre which give a sample size of 120.

3.3 Data Collection

The data for this study were collected by the use of a structure questionnaire which was administered to yam processors in the study area. Data collected are socio-economic characteristics of the respondents, costs and return from processing, various steps in the value chain and the factors that hindered their production.

3.4 Data Analysis

Data was analyzed using descriptive statistics, profitability and budgetary analysis.
The Net Income was calculated as follows:
NI=GI - TC
Where
NI = Net Income (N)
GI = Gross Income (N)
TC = Total Cost (N)
The profitability of yam processing is determined using the formula below,
Rate of Return = NI/TC
NI = Net Income (N)
TC = Total Cost (N)
Gross Ratio: Measures the overall success of an investment; the lower theratio, the higher the rate of return per Naira.
Gross Ratio= TC/GI
GI = Gross Income (N)
TC = Total Cost (N)

4.Result and Discussion

Table 1 shows that majority (70.8%) of the respondents were female, while most (52.5%) of the respondents have an age range between 41-60 years, and 90% of the respondents were married. Furthermore the result indicates 34.2% of the respondents to have undergone a primary education and 51.7% of them were Muslims and

all of them were Yoruba's. More so 74.2% of the respondents have household size range of 1-5 and 58.3% of the respondents signify to have access to credit facilities while majority (74.2%) of the respondents claim to earn 10001-30000 monthly income.

Table 2 indicates that majority (88.3%) of the respondents process yam into flour, while all of them uses small processing plant and 88.3% process manually. Furthermore 50.8% hired labour for processing and 73.3% produce between 1-5bags per week during the production season while 44.2% sell daily to market. Moreso all of them determine market price through bargaining.

The chart for various steps in the value chain indicates that all of them under the same steps in converting yam to yam flour and yam to yam flakes. Majority of them undergo the steps manually due low technology in the area of yam processing.

Table 3 shows that the business is viable and profitable because total cost of N16000 was incurred in the production of 250kg of yam flour and a gross income of N22000 was realized and this give the processor a net return of N6000.The rate of return f 0.38 was also realized, this implies that for every N1.00 invested, N0.38 is realized by the processor. Gross value of 0.73 was obtained. Since the gross value is less than one it implies that the business is making profit.

Table 4 shows the ranking of problems associated with yam processing in the area with lack of infrastructural facilities such as electricity, water, good road network ranked first and change in government policy is the least problem identified in the study area.

5. Conclusion and Recommendation

The study shows that yam processing into yam flour is a profitable business that investors can divert their resources into its production. The following recommendation were given to provide needed support to the yam farmers, yam processors, yam flour marketers

- The government at all level should help in road construction and rehabilitation of all linking roads between all the connecting routes, to help in reducing problems associated with transportation.
- The business minded individual, local government authority should endeavour to go into construction of processing facilities where yam farmers, or processors can easily access for processing of their produce at reasonable price.
- Proper storage facilities should be made available to yam farmers in form of grants or at subsidized rate to enable farmers keep yam produce for long time and reduce post-harvest lost.
- Farmers and yam processors should be educated by extension service within their locality on the impact of climate change on their produce and how to guide against any future possible loss.

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Table 1: The Socio-economic characteristics of respondents. (N=120)

Variables	Frequency	PercentageCP=100
Sex:		
Male	35	29.2
Female	85	70.8
Age:		
21-40 years	52	43.3
41-60 years	63	52.5
Above 60years	5	4.2
Maritalstatus:		
Single	7	5.8
Married	108	90
Divorce	5	4.2
Educational level:		
No formal education	20	16.7
Adult education	18	15
Primary education	41	34.2
Secondary education	35	29
Tertiary education	6	5
Religion:		
Islam	62	51.7
Christianity	53	44.2
Traditional	5	4.2
Ethnicity:		
Yoruba	120	100
Igbo	-	-
Hausa	-	-
Householdsize:		
1-5	31	25.8
6-12	89	74.2
Accesstocredit:		
Yes	76	58.3
No	44	41.7
Income per Production.		
Less than 10000	15	12.5
10001-30000	89	74.2
30001-50000	16	13.3

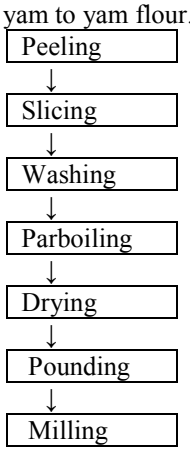
Source: field survey 2014.

Table 2: Distribution of respondents based on their production pattern.

Variables	Frequency	%
Form processed:		
Yam flour	106	88.3
Flakes	14	11.7
Size of processing plant:		
Small	120	100
Large	-	-
How do you process:		
Manually	106	88.3
Mechanically	14	11.7
Hired labour:		
Yes	61	50.8
No	59	49.2
Quantityofproduct (bags)/week:		
1-5	88	73.3
6-10	30	25.0
11-15	2	1.7
How do you market:		
Daily market	53	44.2
Supplying retailer	39	32.5
Supply food vendor	28	23.3
How is market price determined:		
Bargaining	120	100
Association	-	-

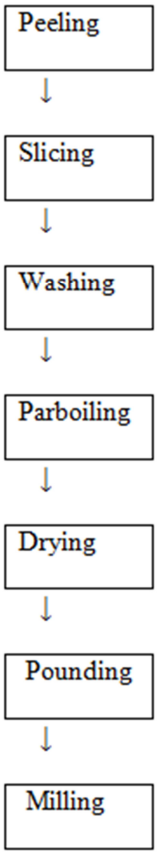
Source: Field survey 2014.

Chart 1:The various steps involved in yam processing in the study area.
Activities undertaken during processing of yam to yam flour.



Source: field survey 2014.

Activities undertaken during processing of yam to Yam flake.



Source: field survey 2014.

Table 3: Cost and returns analysis of yam processed into yam flour.

COST INCURRED PER 250Kg OF DRY YAM.	AMOUNT (₦)
Cost of Yam tubers	9000
Cost of Labour	2500
Cost of Fuel/wood/water	2150
Cost of transporting yam tuber	1200
Others(packaging, storage)	1150
TOTAL COST (TC) =	16000

Gross Income per 250kg of dry yam=N22000
Net Income =N6000
Rate of return= 0.38
Gross value=0.73
Source: Field survey 2014.

Table 4:Problems associated with yam processing in the study area.

Factors	Frequency/Percentage.	Rank
Lack of Transportation.	110 (91.7)	4
Problems associated with Climate change	113(94.2)	2
Change in government policy	70(58.3)	8
Non Availability of yam in the right quality.	108(90.0)	5
Poor communication network.	103(85.8)	6
Lack of infrastructural facilities.	120(100.0)	1
Inadequate processing facilities	80(66.7)	7
Inadequate credit facilities	112(93.3)	3

Source: Field survey 2014.

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