ECONOMICS OF YAM FLOUR MARKETING IN IBADAN METROPOLIS OF OYO STATE, NIGERIA

Ashaolu O.F.*, Agbonlahor M.U.*, Adewuyi S.A.*, Ayinde I.A.*, Fakoya E.O. and A. Akinyo***

** Department of Agricultural Economics and Farm Management, University of Agriculture, Abeokuta.*

*** Department of Agricultural Extension and Rural Development, University of Agriculture, Abeokuta.*

ABSTRACT

The study attempted to determine the efficiency of yam flour marketing with a view to ensuring the existence of continuous supply and profitable market outlets for yam flour in Ibadan metropolis. Primary data were collected with the use of structured questionnaire from one hundred and twenty (120) respondents in "Orita-merin" and "Bodija" markets using a combination of purposive and simple random sampling techniques. Data were analyzed using the Descriptive statistics, Marketing Efficiency and Net Marketing Margin analyses, the Gini-coefficient as well as the Concentration Ratio and the Herfindahl Index. The results show that yam-flour markets were gender sensitive, as majority of the sellers (85 percent) were females. The mean age of sellers was 37 years. Prices fixed were mainly determined by haggling (50 percent), demand and supply forces (about 25 percent) and weighing (about 18 percent). Both markets were economically efficient, it was observed that marketing cost is higher at Bodija market than Orita-merin market but efficiency was higher at Orita-Merin market. The Gini-coefficients of 0.3530 and 0.4467 for Orita-merin and Bodija markets, respectively, implied that the former tilts more to a competitive market situation while Bodija market tends towards a monopolistic competition. This is possible when the products can be differentiated with odour, taste, colour and texture. The concentration ratio for the dominant groups at Orita-merin market were 22%, 23% and 23% = 68 % and the Herfindahl index (HI) is 0.16, whereas the concentration ratio for the dominant groups at Bodija market were 20%, 24% and 26% = 70 %, while the Herfindahl index (HI) is 0.17. To increase the pricing efficiency of yam flour marketing among sellers, the state government should look into those activities that could probably have contributed to increases in the marketing cost especially transportation, grinding/processing costs and rent.

Key words: *Marketing, efficiency, yam-flour, Ibadan metropolis, Oyo state.*

INTRODUCTION

1.1 Yam Production and Marketing in Nigeria

Yam is an important staple food crop in tropical

countries and the humid part of the world. It accounts for over 70% of the daily calorie intake of millions of people with Nigeria producing 71% of the total world production (Onwueme 1978). Several recipe of yam are prepared for domestic consumption and a large quantity can be produced for export and industrial processing. Yam is therefore a highly economic crop that contributes greatly to gross domestic product of the country (Salako *et al*, 2002).

The most economically important species grown as staple foods in Africa are *Dioscorea rotundata* (white guinea yam), *D. cayanensis* (yellow yam) *D. dumetorum* (bitter yam), and *D. bulbifera* (aerial yam), (Onwueme 1978; Raemaekers, 2003). Among several food forms into which yam can be put include pounded yam, boiled yam, roasted or grilled yam, fried yam slices and yam balls, mashed yam (pounded paste), yam chips and flakes. Fresh yam tubers are also peeled, chipped, dried and milled into flour.

This flour is cooked in boiling water and turned into thick paste and eaten with soup. Among the Yorubas in western Nigeria, yam flour is highly favoured where the reconstituted food (dried yam chips that are crushed and ground into flour to make elastic dough) is called "Amala" or "Telibo-wo", and in east of the river Niger, it is called "Akwunaji". (Orkwor et al., 1998; IITA, 2002).

One of the most important indicators of the effectiveness of a marketing system, especially in enhancing farm production and marketing is the degree to which the marketing system maintains inter-seasonal price stability. This is because price instability constitutes a serious market risk to sellers as well as buyers. It has been affirmed that the price system should be able to control the distribution of goods seasonally as well as over longer periods. It should reflect consumer preferences for the form in which the product is expected to be presented, (Kohls and Uhl, 1990). In addition, the efficiency of a product market has a strong relationship with the cost of making the product available, and the final price dictates the consumer direction (Wensley, 1982). This view is also shared by Adekanye and Olayide (1988), and Kellard (2002). There is instability in the price of yam flour throughout the year in Nigeria.

From the foregoing, there is need for yam-based research and development in Nigeria to exploit the technological opportunity for development of storage, processing and marketing infrastructure of yam crop. Apart, the study of this kind will give a blue-print in assisting policy makers on appropriate steps and programmes to embark upon to ensure that the supply of yam flour become available throughout the year and to ensure that profitable market outlets exist. By this, the producers and consumers will be better off as producers will be sure of selling all they can produce of the products at desirable price at any period of the year while the consumer will be sure of getting this food item throughout the year also at affordable prices.

The study was attempt to determine the economics of yam flour marketing in Ibadan metropolis of Oyo State, Nigeria. This objective was specifically achieved by characterizing the bio-data of yam sellers and determining the profitability of yam flour marketing. We also described the structure of yam flour market, evaluated and compared the efficiency of yam flour marketing in the two markets studied. That is, the pricing efficiency in terms of the degree of competition and the responsiveness of the marketing system to consumer direction.

2.0 MATERIALS AND METHODS

2.1 The Study Area

The area chosen for the study is Ibadan metropolis of Oyo State. Ibadan is one of the most populous cities in Nigeria; in fact, the second largest city in Africa and the largest city in West Africa. With the 1991 population

census estimates, Ibadan has a population of 3.48million (Census News, 1992).

Geographically, Ibadan is located in the heart of Yorubaland at an elevation of 210 meters above sea level and roughly lies on latitude 7°,20'N and longitude 3°,5'E in the south-western part of Nigeria. Majority of the people in this metropolis are Yorubas with little dialectical variations although other ethnic groups such as Ebiras, Hausas and Igbos co-exist. It has 11 Local Government Areas and it is the second industrious city after Lagos in the western part of Nigeria. Owing to its rapid growth, it has attracted many migrants into its administrative, commercial, research and educational institutions.

Ibadan is predominantly a commercial center with various markets. It is known for cheaper source of food materials because of the farming activities which is the major occupation of the neighbouring towns. The agricultural products from these agrarian towns are brought to Ibadan for sales at interval.

2.2 Sampling Size and Sampling Techniques

Information on marketing of yam flour was obtained from primary and secondary data. The primary data were collected through the use of structured questionnaire. Purposive sampling method was used to collect specific information from yam-flour sellers.

Two major markets were purposively selected in Ibadan and they were "Orita-merin" and "Bodija" markets. The two markets were among the few large markets in Ibadan metropolis. They have network of roads leading to them, and other infrastructural facilities present made opportunities for commodity marketing very high. Bodija market is close to many big institutions of learning and patronage is very high throughout the day. These markets were selected because they were known to be main markets for this product (yam flour) and there are no defined market sessions throughout the day while patronage is also throughout the week.

A total of one hundred and twenty (120) respondents were selected from the two markets; that is, sixty (60) respondents from each market. The yam-flour sellers were interviewed using a simple random sampling technique and was complemented with personal interview because some of the respondents had little or no formal education. Care was taken to ensure that those who were earlier interviewed were not visited again in the next round of interview. Data were collected on the respondents' socioeconomic characteristics such as age, marital status, household's size, years of marketing experience, educational level and methods of price determination due to weights and measurement problems.

2.3 Analytical Procedures

The techniques for data analysis include the Descriptive statistics, Marketing Efficiency and Marketing Margin analyses and the Gini-coefficient.

2.3.1 Descriptive statistics

It involves the use of frequency tables, graphs, percentages and averages. It was used to analyze the socio-economic characteristics of the respondents which include the age, educational level, sex, marital status etc.

2.3.2 Budgetary Analysis through the Net Marketing Margin

The marketing margin is the difference in the price paid to the first seller and the price paid by the final buyer. It can also be defined as the difference between the price of good at farm gate and the price paid by the final consumer for the same quantity of good. It is a measure of market performance of the product. It was used to analyze the profitability of yam flour. It is given as:

$MM = TR - MC$ ..... (1)
Or, $MM = SP - PP$ ..... (2)
$NMM = MM - MC$ ..... (3)

Where,
MM = Marketing margin
TR = Total Revenue/sales of yam flour.
MC = Total Marketing Cost
SP = Selling Price
PP = Purchase price
NMM = Net Marketing Margin

The total marketing cost is made up of marketing levy, rent and transport, processing, labour and security costs.

2.3.3 Gini-Coefficient and Lorenz Curve

This was used to measure the concentration of yam-flour sellers as determined through their revenues. It shows how sales volume is shared among the sellers. The measurement is based on the Lorenz curve which in turn measures the degree of inequality in sales distribution and also to describe how perfect and competitive the market was.

Market structure of each trade was measured by the sellers' concentration. This was obtained by calculating the Gini-coefficient of the revenue of the sellers as used by Broadway et al. (1984). This states that:

$G = 1 + 1/n - 2/n\mu\ (y1 + 2y2 + ... nyn)$ ..... (4),
which can be translated into
$G = 1 + 1/n - 2/n2\mu \Sigma XY$ ..... (5)

Using Okereke and Anthonio (1988), equation (5) was reduced to a simple model as
$G = 1 - \sum XY$ ..... (6)

Where G = Value of Gini-coeffcient
X = Proportion of sellers.
Y = Cumulative proportion of sales revenue.
n = Number of observation
μ = Mean of variable Y

Gini-coefficient is a number between 0 and 1, where 0 corresponds to absolute or
perfect equality of sales while the value of 1 corresponds to perfect inequality (e.g. one person has all the market share and everyone else has zero share). In other words, when the Gini coefficient approaches zero it means that the market is tending towards perfect competition and if it approaches 1, it means that the market tends towards monopoly.

The Gini-coefficient approach to the determination of market structure can be supported by using the Concentration Ratio and the Herfindahl Index. The concentration ratio is the measure of the percentage market share in an industry held by the largest firms within that industry. For example, suppose 3 firms dominate a specific industry, such as beverages, holding 80% market share of the beverage industry. The concentration ratio of the beverage industry would thus be 80%. Another measure of concentration in an industry can be expressed using the Herfindahl index which is simply the sum of the squares of the market shares for each firm within the industry and is always less than one. It is given as

$HI = \sum (market\ share)^2$, (Investopedia, 2011)..... (7)

2.3.4 Marketing efficiency analysis: The pricing efficiency approach to the determination of the marketing efficiency used in this study is an output-input ratio analysis; that is, marketing efficiency is the maximization of the ratio of output to input. The output is synonymous with total revenue while the inputs are the resources used or the cost incurred. It is given as,

$$ME = \frac{TR}{MC} = \frac{\text{Total sales}}{\text{Total Marketing Cost}} \quad \text{..... (8)}$$

where,
ME = Marketing Efficiency; and TR and MC are as defined earlier.
A market is efficient when marketing efficiency equals to one or greater than one and it is inefficient the efficiency is less than one.

3.3 RESULTS AND DISCUSSION

3.1 Socio-Economic Characteristics of Yam Flour Marketers

Table 1 summarizes the distribution of the socio-economic characteristics of the study respondents. In the table, majority of the sellers (85 percent) are females, implying that yam flour marketing is more attractive to female than males in the study area.

About 72 percent of them were in their youthful age-range of between 26 and 45 years meaning that they were still very strong and energetic to carry out the rigorous activities involved in the trade. The mean age was 37years.

About 48 percent of respondents had either secondary or post secondary education and were therefore expected to have access to information that can further promote the efficiency of the marketing system of the product. Also, about 33 percent of the marketers have between 11 and 20 years of experience although over 43 percent of them had less than 10 years of experience. This implies that there is prospect for the trade since people are moving into it in recent times.

Prices were mainly determined by haggling (50 percent). This result is in line with what Phillip et al. (2006) found out in their study on agricultural price haggling in which case standard measures and grades for commodities offered for sale were absent. The introduction of standardized grades and the provision of improved market information which lead to an increase in consumer satisfaction are an indication of improved pricing efficiency (Adekanye and Olayide, 1988). However, about 25 percent reported that prices were fixed by the forces of demand and supply whereas about 18 percent stated that they arrived at the selling price through weighing.

3.2 Net Margin and Marketing Efficiency Analysis

Table 2 displays the weekly marketing margin and marketing efficiency of the two markets studied. From the cost structure point of view, it was observed that transportation cost and grinding/processing cost accounted for the highest percentage of the total marketing cost in Orita-Merin and Bodija markets, respectively, while storage cost accounted for the least percentage in both markets. Both markets were economically efficient but efficiency was higher at Orita-Merin market.

3.3 Market Structure Evaluation

Tables 3 and 4 show the distribution of yam-flour sellers by monthly sales at Orita-Merin and Bodija markets, respectively. The Tables were used to compute the Gini-coefficients and Lorenz curves shown in Figures 1 and 2. The Gini-coefficient quotient is a measure of inequality. The Lorenz curve is divided by the 45-degree line (always exactly one half) usually referred to as "perfect distribution line" or "line of absolute equality".

Orita-merin market has a Gini coefficient of 0.4430 which is closer to zero than one, denoting that the market tilts more to a competitive rather than monopoly situation. Majority of sellers (41 out of 60) fell within the sales range of N26,001- N35,000. The concentration ratio for the dominant groups were 22%, 23% and 23% = 68 % while the Herfindahl index *HI* is 0.16

Similarly, the Gini coefficient of Bodija market was 0.4361, indicating a market that is monopolistically competitive. It is possible when the products can be differentiated with odour, taste, colour and texture, Also, majority of sellers (42 out of 60) fell within the sales range of N26,001- N35,000. The concentration ratio for the dominant groups were 20%, 24% and 26% = 70 % while the Herfindahl index *(HI)* is 0.17.

4.0 CONCLUSION AND RECOMMENDATIONS.

Yam-flour markets were gender sensitive since both males and females were involved in the

trade although majority of the sellers (85 %) were females, implying that yam flour marketing was more attractive to female than males in the study area.

Prices fixed were mainly determined by haggling (50 %), demand and supply forces (about 25 %) and weighing (about 18 %). Transportation cost accounted for the highest percentage of the total marketing cost in both markets while the storage cost accounted for the least percentage.

The pricing efficiency approach to the determination of the marketing efficiency used in this study is an output-input ratio analysis. Even though both markets were economically efficient, it was observed that marketing cost is higher at Bodija market than Orita-merin market.

Orita-merin market has a Gini coefficient of 0.4430 with the majority of sellers (41 out of 60) falling within the sales range of N26,001-N35,000. The concentration ratio for the dominant groups were 22%, 23% and 23% = 68 % while the Herfindahl index HI is 0.16. Similarly for Bodija market, the Gini coefficient was 0.4361, indicating a market that is monopolistically competitive especially when the products can be differentiated with odour, taste, colour and texture. Majority of sellers in this market (42 out of 60), fell within the sales range of N26,001- N35,000, with the concentration ratio for the dominant groups being 20%, 24% and 26% = 70 %, while the Herfindahl index *(HI)* is 0.17.

The state government should therefore intervene by looking into those activities that could probably have contributed to increases in the marketing cost especially transportation cost, grinding/processing cost and rent. This may indirectly go a long way to increase the efficiency of yam flour marketing among sellers.

REFERENCES

Adekanye, T.O. and Olayide, S.O. (1988). "Definition of Terms". In Adekanye, T.O. (1988). Readings on Agricultural Marketing. Edited. Longman Nigeria Limited. Pp 5–11.

Broadway, R.W. and Neil B. (1984). Welfare in Economics. London, Basil Blackwell.

Census News (1992). *A House Magazine of National Population Census, 3(1): 18-19.*

Investopedia (2011). "Concentration Ratio and the Herfindahl Index" *http://www.investopedia.com*

IITA, (2002) "ph Action news" No 2 March 2002. Macmillan Publishing Company.

Kellard N. (2002). "Evaluating Commodity Market Efficiency: Are Co-integration Tests Appropriate?" *Journal of Agric. Econs, 53(2): 513-529.* Agric Econ Society.

Kohls, L.R. and Uhl, J.N. (1990). *Marketing of Agricultural Products. Marketing of Agricultural Products, 6th edition, New York,* Macmillan Publishing Company pp. 18–21.

Okereke, O. and Q.B.O. Anthonio (1988). "The structural characteristics of the market for grains in Eastern Nigeria". In Adekanye, T.O. (1988). Readings on Agricultural Marketing. Edited. Longman Nigeria Limited. Pp 116 - 124.

Onwueme,I.C. (1978). *The Tropical Tuber Crops.* John Wiley and Sons Ltd. Pg 3-101.

Orkwor,G.C., Asiedu and I.J. Ekanayeke (eds) (1998). "Food Yams Advances in Research"; *IITA and NRCRI,* Nigeria.

Phillip, D.O.A., Oloruntoba, A., Fakoya, E., Phillip, B., Ashaolu, O. and L. Alogba (2006). "Agricultural Price Haggling: A Case Study of Beef Retail Pricing in Ogun State of Nigeria". *China Agricultural Economic Review,* 4 (4): 494-507.

Raemaekers, R.H. (2003). *Crop Production in Tropical Africa.* Directorate General for International Co-operation, Ministry of Forestry Affairs. External Trade and International Co-operation Bressels, Belgium.

Salako, F.K., S.T.O. Lagoke, A.B.J. Aina, D.Eruvebtine and A.O Dipeolu (2002). "Enhancing Agricultural Resource Base for Youth Employment, Industrial Development and Export". University of Agriculture, Abeokuta, Nigeria.

Wensley J.R.C. "PIMS and BCG New Horizons". *False Dawns Strategic Management Journal* No. 3, April/June 1982.

Table 1: Description of Socio-Economic Variables and Summary Statistics

Characteristics	Frequency	Percent	Cumulative %
Age (years)			
⩽ 25	14	11.7	11.7
26 -35	52	43.0	54.7
36 -45	34	28.7	83.4
46 -55	6	5.0	88.4
56 -65	10	8.3	96.7
⩾ 65	4	3.3	**100.0**
Total	**120**	**100.0**	
Mean	37		
Std. Dev	10.95		
Sex			
Male	18	15.0	15.0
Female	102	85.0	**100.0**
Total	**120**	**100.0**	
Marital Status			
Single	2	1.7	1.7
Married	102	85.0	86.7
Divorced	4	3.3	90.0
Widowed	12	10.0	**100.0**
Total	**120**	**100.0**	
H ousehold size			
⩽2	6	5.0	5.0
3-5	32	26.7	31.7
6-8	74	61.7	93.4
9-11	6	5.0	98.4
⩾ 12	2	1.7	**100.0**
Total	**120**	**100.0**	
Mean	6		
Std. Dev.	1.62		
Mktg Exp. (years)			
⩽ 10	52	43.3	43.3
11 -15	24	20.0	63.3
16 -20	16	13.3	76.6
21 -25	8	6.7	83.3

Table 2: Average Yam-Flour Net Marketing Margin and Marketing Efficiency for Orita Merin and Bodija Markets Per Week.

Parameters (₦/week).	Orita Merin (₦)	Bodija (₦)
Total sales	27,886.67	27,928.33
Purchase price	20,300.00	18,650.00
Marketing margin	7,586.67	9,278.33
Marketing Cost		
Grinding/processing	931.81	1,231.67
Storage cost (₦/bag)	125.00	164.29
Association dues	320.00	896.67
Transportation cost	1,121.25	,000.00
Rent	588.00	422.00
Total Marketing Cost	3,086.06	3,714.63
Net margin	4,500.61	5,563.70
Marketing Efficiency	9.04	7.52

Source: Field survey, 2006

⩾ 26	20	16.7	**100.0**
Total	**120**	**100.0**	
Mean	15		
Std. Dev.	6.10		
Price Determination			
Association fixes price	8	6.7	6.7
Price by known weight			
(use of scales).	22	18.3	25.0
Demand -suppl y forces	30	25.0	50.0
Haggling	60	50.0	**100.0**
Total	**120**	**100.0**	
Educational level			
Informal education	16	13.3	13.3
Primary education	46	38.3	51.6
Secondary educ	52	43.3	94.9
Post secondary	6	5.0	**100.0**
Total	**120**	**100.0**	

Source: Field Survey, 2006

Table 3: Distribution of Yam -Flour Sellers by Weekly Sales at Orita-Merin Market Ibadan, Oyo State

Sales (₦)	Number of sellers	Prop. of sellers (X)	Cum. prop. of sellers	Value of sales	Prop of sales	Cum. Prop. of total sales (Y)	XY
20, 000 - 22,000	5	0.08	0.08	8229.33	0.08	0.08	0.0064
22,001 – 24,000	6	0.10	0.18	4114.67	0.04	0.12	0.0120
24,001 – 26,000	8	0.14	0.32	11315.33	0.11	0.23	0.0368
26,001 – 28,000	13	0.22	0.54	52462.01	0.51	0.74	0.1628
28,001 – 30,000	14	0.23	0.77	21602.00	0.21	0.95	0.2090
30,001 – 35,000	14	0.23	1	5143.33	0.05	1	0.2200
Total	**60**	**1**		**102866.68**	**1**	$G = 1 - \sum XY =$	**0.3530**

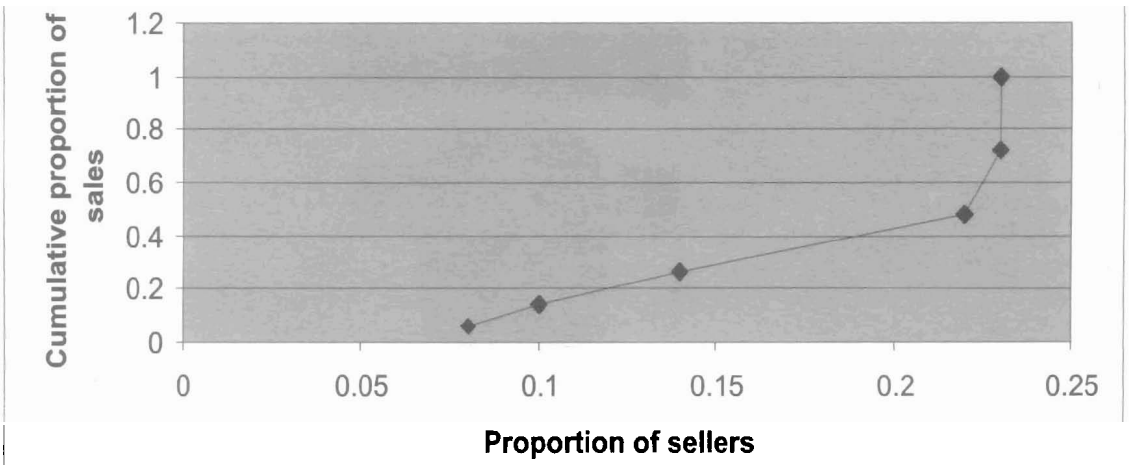
Source: Field Survey, 2006

Table 4: Distribution of Yam -Flour Sellers by Weekly Sales in Bodija Market Ibadan, Oyo State

Sales (₦)	Number of sellers	Prop. of sellers (X)	Cum. prop. of sellers	Value of sales	Prop of sales	Cum. Prop. of total sales (Y)	XY
20, 000 - 22,000	4	0.06	0.06	7493.33	0.08	0.08	0.0048
22,001 – 24,000	6	0.10	0.16	2810.00	0.03	0.11	0.0110
24,001 – 26,000	8	0.13	0.29	3746.67	0.04	0.15	0.0195
26,001 – 28,000	12	0.20	0.49	18733.34	0.20	0.35	0.0700
28,001 – 30,000	14	0.24	0.73	41213.34	0.44	0.79	0.1980
30,001 – 35,000	16	0.26	1	19670.00	0.21	1	0.2500
Total	**60**	**1**		**93666.68**	**1**	$G = 1 - \sum XY =$ **0.4467**	

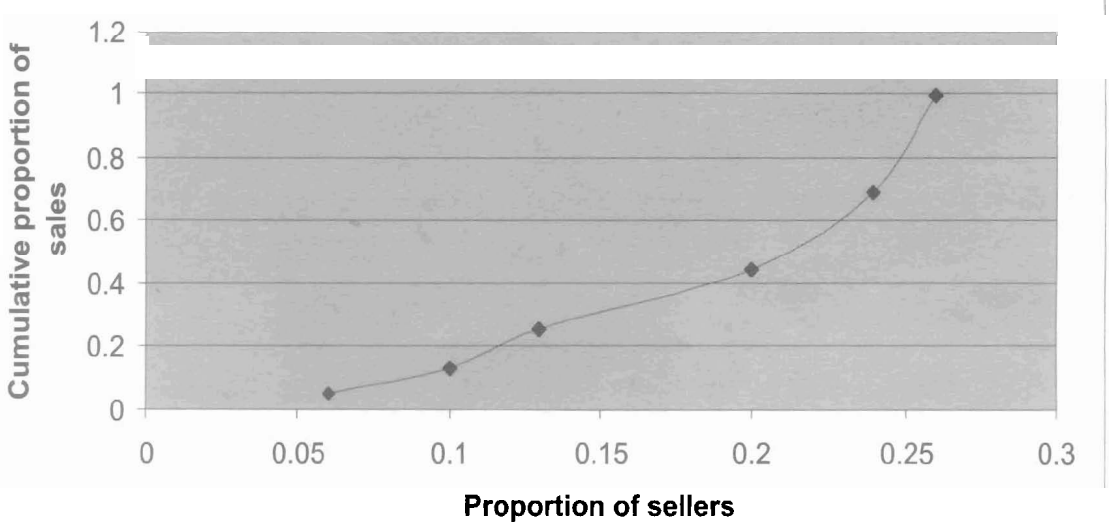
Source: Field Survey, 2006

Fig. 1: Lorenz curve of yam-flour marketing, Orita-merin



Source: Field Survey, 2006

Fig. 2: Lorenz curve of yam-flour marketing, Bodija



Source: Field Survey, 2006