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Profitability Analysis of Rice Processing and Marketing in Kano State, Nigeria

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ABSTRACT: The study determined the profitability of rice processing and marketing in Kano State. The objective of the study was to assess the profitability levels of rice processing and marketing, evaluate the value added to the commodity at each stage in the study area and determine the most efficient services produce. Primary data were collected from 120 randomly selected respondents comprising parboilers, millers, retailers and wholesalers using interview schedule. The findings indicated that Net Milling Income of millers was ₦3,378,855.08 per respondent per year; the value added was ₦5,736,658.82 and service efficiency was 243.3. This result, therefore, showed that the Net Milling Income, value added and service efficiency for millers were higher, followed by wholesalers (₦2,239,086.63, ₦2,239,086.63 and 3.5 respectively) and retailers (₦422,230.77, ₦422,230.77 and 5.65 respectively), with the parboilers having the least. The millers had a Net Present Value of ₦10, 555,709 at 22% and an Internal Rate of Return of 140 which shows that the business of milling can payback money loaned from bank at even 140% interest rate. Based on the findings, it was recommended that the parboilers should be paid for their services separately from costs of input for parboiling and the traders should enhance the existing co-operatives societies and encourage bulk purchase and transportation of the milled rice. This will reduce the high cost of milled rice as well as reduce the cost of transportation.
Keywords: Rice, Processing, Marketing, Profitability

INTRODUCTION

Rice (*Oryza sativa* L.) being the second largest consumed cereal (after wheat) shapes the lives of millions of people; more than half the world's population depends on rice for about 80 percent of its food calorie requirements. Rice has been a good partner to mankind. The adaptations in terms of ecological, economical and technological changes around rice facilitated this "partnership between man and rice" (Braun, 2006). For instance, in terms of rapid population growth, soaring rice demands were met largely due to the increase in rice production. As such, we must continue to nurture this partnership (Braun, 2006).

Local rice demand is growing quickly due to population growth and urbanization. Nigeria's estimated annual rice demand is put at 5 million metric tons while annual production on the average, was about 2.21 million tons of milled rice product leaving a deficit of 2.79 million tons which is bridged by importation (NRDS, 2009). Domestic demand for rice is projected to rise to 7.5 million tons by 2013, on the assumption that demand rises at 10% per annum, with demand for local rice growing at

half the rate of the imported rice (NRDS, 2009). This increase in demand is because rice has changed from being an elitist to a staple food for many Nigerians. Many local dishes are prepared with rice because of its relative ease in terms of storage and preparation. In terms of local production, rice is now one of the main cereals produced by Nigerian farmers; it is cultivated in virtually all the agro-ecological zones of Nigeria. It covers both the upland and the swamps, depending on the variety (KNARDA, 2007).

Global value chain concept, as pointed out by Global Value Chain Initiative GVCI (2007) is an arrangement that describes the linkages of participants and their value creating activities that enhanced the movement of goods and services from production, processing to the end user (consumer). The number and conduct of the participants along the chain determine its efficiency, pricing and returns accruing to each participant at every state (GVCI, 2007). Daniel *et al., (*2006) pointed out that value chain is an analysis that allows an understanding of a sequence of activities, which are needed to bring

a product from its production to the final consumer.

The 'value chain view' implies a system of interaction and relationships between different actors and organizations. The system usually includes more than a handful of producers and market stalls. In value chain, business development services such as the enabling environment are integral part of the chain just like the producers, processors, retailers and consumers (Daniel *et al.,* 2006). Therefore, understanding the mechanism within the value chain system mitigates distinguishing bottlenecks and failure thereby creating improvement possibilities within the system.

The value chain model asserts that a product is rarely directly consumed at the place of its production. It is transformed, combined with other products, transported, packaged, and displayed and so on until it reaches the final consumer. This identifies the various actors who are linked by trade; own the raw materials, intermediate products and final products and services and each add some value to the product. Therefore the value chain model supposes that by understanding these interactions, it is possible for private and public agencies (including development agencies) to identify points of intervention to:

  i.   increase efficiency thereby increasing total generated value, and

  ii.   improve the competence of the intended actors to increase their share of the total generated revenue.

The main thrust of the study was to determine the profitability of paddy rice processing and marketing in the study area. The study also to determine the point where value is most added along the chain for profit maximization. A part from helping to identify the important actors and leverage points requiring innovative intervention for the purpose of increase in production, efficiency and effective management, the information generated from the study may also be of importance to practicing rice farmers, parboilers, millers and traders who may use it to improve on their performance.

Methodology
Study Area and Sampling Technique
The study was conducted in Kano State of Nigeria. The existing Kura– Kano Rice Corridor which stretch up to Tudun Wada and the famous Garko-Sumaila rice-production axis are an important rice production and processing areas in Kano State. The Kura- Kano Rice Corridor is an important rice production and processing clusters in the State, the corridor processed even more rice than is being produced in the immediate surroundings (USAID, 2005). The State therefore, has a significant number of producers, processors and quality oriented retail markets for both paddy rice and milled local rice across the State most of which is located along the Kura – Kano rice corridor.

Six Local Government Areas (LGA's) were purposively selected based on the intensity of rice processing and marketing. From each of the six LGA's two major rice processing and marketing clusters were purposively chosen. From each cluster, 10 paddy rice processors and traders were randomly selected for the study given a total of 120 respondents.

Data collection
Interview schedule using close and open ended questionnaire were used in collecting primary data from the respondents, while secondary data were sourced from agricultural journal, monographs, textbooks, browsing on internets, records from Ministry of Agriculture and Natural Resource and Kano State Agricultural and Rural Development Authority (KNARDA). Data were collected on rice processing, parboiling and milling operations. Information collected on parboiling operations were costs at various stages of parboiling such as cost of cornstalk, firewood, water, kerosene, soaking, steaming, drying, spreading, storage, fixed assets used, transportation and marketing. Data on milling were collected on various costs of milling operations such as pre-milling, cleaning, hulling, milling, polishing, grading, de-stoning, storage of milled rice, transportation marketing as well as cost of fuel, diesel and various spare parts. While data collected on marketing included unit prices of different categories of rice, cost of transport, cost of re-milling, winnowing, handling and storage.

Data analysis

The data generated through the interview schedule were subjected to various analyses in order to achieve the stated objective of the study. Descriptive Statistics, Farm Budgetary Technique, Value Added Model and Measure of Efficiency were used in analyzing the data. Some costs incurred in the processing process were continuing in nature as such, Net Present Value (NPV), Benefit Cost Ratio (BCR) and Internal Rate of Return (IRR) were computed to determine the yearly return which is the investments worth in the different types of categories over their entire useful life and time value of money was taken into consideration.

Model specification

Net processing income was calculated as follows:-

NPI = GPI-TC

Or

NPI = GR – TFC – TVC

Where:

NPI/NMI = Net Processing/Marketing Income (₦)

GR = Gross Revenue (₦) or Gross Receipts (GR) is the total output multiply by the price per unit of produce.

TFC = Total Fixed Cost (₦) include cost of all fixed inputs used in parboiling, processing and marketing of processed rice. These costs include depreciation on containers, pots, taxes paid and so on.

TVC = Total Variable Cost (₦) - Total Variable Cost or operating cost in this case include costs of paddy, transport and so on.

The NPV is expressed mathematically as:-

$$NPV = \frac{R1}{(1+i)^1} + \frac{R2}{(1+i)^2} + \frac{R3}{(1+i)^3} + --- \frac{Rn}{(1+i)^n} - C$$

Where

NPV = Net present value (₦)

I = Interest rate (₦)

R1 – Rn = Annual net cash flows (₦)

C = Cost of initial investment (₦)

N = Years of useful life of different categories of enterprise

The benefit cost ratio is expressed as follows:-

$$BCR = \frac{\sum R_1 / (1+i)^n}{\sum C_1 / (1+I)^n}$$

Where

BCR = Benefit Cost Ratio

R_1 = Annual net Cash flows (₦)

C_1 = Discounted cost of investment (₦)

I = Interest rate (₦)

N = Years of useful life of different categories of processing/marketing

The internal rate of return is also known as the marginal efficiency of capital or yield of investment. It is the discount rate that makes the NPV just equal to zero.

It is expressed as:-

$$NPV = \frac{R1}{(1+i)^1} + \frac{R2}{(1+i)^2} + \frac{R3}{(1+i)^3} + --- \frac{Rn}{(1+i)^n} - C = 0$$

Where :

R1- Rn = Annual net cash flow (₦)

R = Interest rate of return (₦)

C = Initial investment cost (₦)

n = Years of useful life of different categories of processing/marketing enterprises

Value Added and Measure of Efficiency Models:

Value added is a process of increasing the economic value of a commodity. Value added here referred to cost of purchasing transformed paddy or milled rice less cost of paddy or milled rice in its untransformed form and it is express as:-

VA = C_{PT} - C_{PU}

Where:

VA = Value Added

C_{PT} = Cost of purchasing transformed paddy/ milled rice (₦)

C_{PU} = Cost of paddy/milled rice in its untransformed form (₦)

Efficiency is an engineering terminology, which is measured as a ratio of output (Y) per unit of input (X). Therefore measure of efficiency was used to determine the most efficient services provided along the rice value chain in the study area.

This is expressed as:-

$$Processing\ Efficiency = \frac{Value\ Added\ by\ processing}{cost\ of\ processing\ services} \times 100$$

$$Marketing\ Efficiency = \frac{Value\ Added\ by\ marketing}{Cost\ of\ marketing\ services} \times 100$$

Note: The processing comprises of parboiling and milling operations.

RESULTS AND DISCUSSION

The profitability, value added and efficiency at the two different levels of paddy rice processing and marketing were determined and the results are presented in Table 1. Analysis of the results revealed that the Net Parboiling Income per

respondent per year for parboilers was ₦843.15, with a value added of ₦228,925.22 and efficiency of 100.36. The Net Milling Income of millers was ₦3,378,855.08 per respondent per year, the value added was ₦5, 736,658.82 and the efficiency attained by this category was 243.3. Also the Net Marketing Income recorded per respondent per year by the retailers category was ₦422, 230.77, the value added recorded was ₦422, 230.77 and the efficiency attained was 5.65. While the wholesalers recorded a Net Marketing Income of ₦2, 239,086.63 per respondent per year and the value added was ₦2, 239,086.63 and the efficiency attained by this category was 3.5. This result, therefore, showed that the Net Milling Income of ₦ 3,378,855.08 with value added of ₦5, 736,658.82 and an efficiency of 243.31 for millers was higher, followed by wholesalers and retailers, with the parboilers having the least. Result of the parboilers invariably showed that they were operating at a small amount of net income.

The parboilers whom were mainly women charged between ₦180 and ₦300 for parboiling 76 Kg to 100kg of paddy rice depending on the area and location. Out of this amount charged the costs of firewood, kerosene, cornstalk, labour water, rice husk and cost for spreading/ drying processes were all inclusive in the amount. High costs imposed on such activities couple with poor bargaining power among the women folk might have resulted in their low Net Parboiling Income.

The studies of NCRI, (2006), Yakubu *et al.*, (2006) and Olabisi, (2007) concur with the finding that rice parboiling is mostly a women affair and that, although it is a profitable venture, the level of profit is very small compared with enormous work of parboiling paddy rice.

The wholesalers travel far and near to purchase the milled rice in high quantity and may have choice in terms of lower prices than the retailers who mostly were confined within their immediate environment. Also the study revealed that the wholesalers are involved in further value addition processes like re-milling and winnowing to add more value and attract higher price. This explained why wholesalers of processed rice attracted higher Net Marketing Income than retailers.

Further analysis showed that millers had a Net Present Value of ₦10, 555,709 at 22% and an Internal Rate of Return of 140 compared to the Net Present Value of ₦6.574, 865 for wholesalers, ₦2, 025,484 for retailers and ₦386, 842 for parboilers all at 22% with an Internal Rate of Return of 95 each for wholesalers and retailers and 90 for parboilers respectively. Result showed further that the business of milling could payback money loaned from bank at 140% interest rate which is over and above the present Central Bank of Nigeria stipulated commercial lending rate of 22%. Similarly, other ventures, namely; wholesaling, retailing and parboiling could also payback borrowed money at higher interest rate of 95% and 90% respectively.

Table 1: Profitability of rice processing and marketing in the study area (₦) / respondent/year

Item/Category	Parboilers	Millers	Retailers	Wholesalers
Net P. Income	843.15	3,378,855.08	422,230.77	2,239,086.63
Value Added	228, 925. 22	5,736,658.82	422,230.77	2,239,086.63
Efficiency	100.36	243.31	5.65	3.5
NPV@ 22%	386,842	10,555,709	2,025,484	6.574,865
NPV@ 90-150%	1,432	25,361	4,503	3,296
BCR	2.24	2.51	1.09	1.03
IRR	90	140	95	95
Net P. Sale	8%	34%	9%	4%
ROC	40.98	64.26	6,560.64	10,207.12
ROI	1.23	31.90	57.80	13.16
Quantity (tons)	105.5	1,382.16	52.57	482.16

Source: Field Survey 2008/2009

Net P. Income- Stands for Net Parboiling, Milling or Marketing Income
NPV – Net Present Value
BCR – Benefit Cost Ratio
Net P. Sale – Net Profit to Sale
ROC – Return on Capital
ROI- Return on Investment
Quantity – Stands for the quantity processed and marketed by various actors

CONCLUSION

The findings of the study show that Kano State has great potentials for rice processing and marketing. Paddy rice processing and marketing is a worthwhile investment at both processing and marketing level as evident in the net processing/marketing income, value added and internal rate of return recorded by all the categories of actors. There are prospects for processors and marketers, however higher profits await them if all shortcomings are properly addressed. In this respect, the parboilers should be paid for their services separately apart from costs of input for parboiling. The traders should enhance the existing co-operatives societies and encourage bulk purchase and transportation of the milled rice. This will reduce the high cost of milled rice as well as reduce the cost of transportation.

REFERENCES

Braun, J.V. (2006). *Public Policy and International Collaboration for Sustaining and Expanding the Rice Revolution* A keynote at the 2nd International Rice Congress on "Science, technology and trade for peace & prosperity "International Food Policy Research Institute (IFPRI) Washington D.C., USA.

Daniel, R., Agridea, G. and Adreas, G. (2006). The Roles of Donors in Value Chain Intervention. *Rural Development News.* **2:** 7-15.

Global Value Chain Initiative (GVCI) (2007): Institute of Development Studies www.ids.ac.uk/globalvaluechains/index.html.Retrievedon 26th March 2008.

Kano State Agricultural and Rural Development Authority (KNARDA) (2007). *The planning in upgrading of Rice Production in Kano State.* A package prepared by Marditech Corporation Sdn. Bhd. Malaysia for KNARDA. 1-44.

National Cereal Research Institute (NCRI) (2006). *Financial Analysis of Rice Parboiling/Processing System in Bida, Niger State.* Project report submitted to Promoting Pro-poor Opportunities in Commodity and Service Markets (PrOpCom). Funded by Department of International Development. U.K. An unpublished monograph series number 6.

National Rice Development Strategy (NRDS) (2009). A working Document prepared for the Coalition for African Rice Development May 2009.

Olabisi, O. (2007). *Financial Analysis of Parboiling and Milling Techniques in the Kura Kano Corridor.* Project report submitted to Promoting Pro-poor Opportunities in Commodity and Service Markets (PrOpCom). Funded by Department of International Development. U.K. An unpublished Monograph series number 18. 1-29.

USAID-NESG (2005). *Approaches on the Markets and PrOpCom Projects.* Agricultural Summit Paper in Support of Market–led Development. http://www,nesgroup.org. Retrieved 21st December 2006.

Yakubu, A.A., Oladusu, B.O. and Kyiogwom, U.B. (2006). *Rural Employment Generation and Poverty Alleviation through Small –Scale Processing Ventures in Nigeria: The Case of Rice Processing.* A Proceeding of the 2006 Annual Conference of Nigerian Association of Agricultural Economist. Held at LAUTECH. Ogbomosho.