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## ECONOMICS OF VALUE ADDITION TO CASSAVA TUBERS IN NIGERIA

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### ABSTRACT

Adding value to agricultural products produced in the country has been the concern of several administrations in Nigeria. This is due to the many benefits of value addition to agricultural produce to the farmers and the nation. In this study, a comparative analysis the cost and returns associated with processing of cassava tubers into cassava flour, starch and chips was carried out. The aim was to ascertain the level of profit of each type of cassava product given the process of adding value to cassava tubers and transforming them into each type of product. Results reveal that processing of cassava tubers into chips yield the highest net profit. This was followed by cassava flour. The lowest net profit was associated with processing of cassava tubers into garri.

### INTRODUCTION:

Cassava is the mainstay of over 200 million people in Africa. It is a reliable food crop and contributes more cash income to households than any other crop (Jones, 1959). Records show that there has been a steady increase in cassava production over the last decade. Estimated world production of cassava in 2000 was 176.9 million metric tons. About 52% (92.7 million metric tons) of the world production came from Africa and a total of 33.9 million metric tons was produced by Nigeria. This translates to 19% of world production and 37% of Africa's output, and since 1990, Nigeria has remained the world's largest producer of cassava. After Nigeria, the largest producers are Brazil, Thailand, and Indonesia. The latter two are the world's largest exporters of cassava and cassava products, accounting for 90% of world cassava trade. In spite of being a leading producer of cassava, Nigeria is yet to realize the full potentials of this crop, particularly in regard to its industrial use. This situation has been attributed to several factors, chief among which is inadequate mechanization of both production and processing [New Nigerian Foundation and Citizens International (NFCI), 2001]. The direct outcome of this is that much of the cassava in Nigeria is being used for food in the form of garri, foofoo, tapioca. A negligible 0.2% of cassava production is processed into starch for sale in local markets for local laundry shops (NFCI, *op cit*).

Cassava is a highly perishable commodity with a post harvest life of less than 72hours (Oluwole and Adeyemo, 2001). It has been estimated that about 23% post harvest losses is associated with freshly harvested cassava roots, if not processed within 48 hours of harvest. According to Oluwole and Adeyemi, (*op cit*) quantitative losses of 20 – 30% has been recorded for fresh cassava produced in Lagos State. According to Chemonics International (2001), Nigeria has potential to sell a quality branded yucca to the international markets (EU-US) if basic improvements are made to the quality of cassava produced and strategic alliances are formed with appropriate distributors. The Nigerian niche market for fresh cassava is only a starting point. In Nigeria, cassava can be processed into many different forms convenient forms convenient for consumption (Peter, 2004). These forms include garri, cassava flour, chips and starch, among others. Except chips and starch other forms in which cassava is processed into are but the traditional foods, (eg garri, foofoo, tapioca, flour). Nonetheless, these forms do not attract sufficient patronage in the international market and therefore will not be the focus of this paper.

Many studies have identified value addition as an important enhancer of commodity export. For instance, Bianchi and Garcia (2007) report that in order to improve the image of a country's food products an access to new markets, a country has to change its positioning and develop high-quality products with higher prices. And that it is very important for a country to compete internationally with products that have greater value added, in order to achieve real differentiation regarding products offered by other countries.

Given the paradox of cassava in Nigeria (Nigeria being the largest producer yet the least exporter) it seems obvious that the solution to the problem lies in being able to add value to Nigerian cassava so as to meet the demand in the international market. This requires processing (or adding value to) cassava tubers (the primary product from cassava) into such products as starch, chips, and such other products in the form and quality that meet international standard. Nonetheless, in a free enterprise economy like Nigeria, the cassava producers and processors like other entrepreneurs would be interested in the cost and returns associated with adding value to cassava to obtain any of

these products. This position is informed by the assumption of profit maximization as the aim of business. Therefore, the objectives of the study which culminated in this paper were to:

- (i) Estimate and compare the cost and return of adding value to cassava through processing cassava into three products viz: flour, starch and chips and;
- (ii) Draw implications of the findings for both industry and policy in Nigeria.

## RESEARCH METHODS

**The Study Area:** Akwa Ibom State: (i) Sites: 5 dominantly cassava producing communities – Ikot Eyo (Nsit Ubium Local Government Area), Mbiaya (Uruan Local Government Area), Ikot Abiyak (Itu Local Government Area), Idu (Uruan Local Government Area) and Ikot Ataku (Eket Local Government Area).

**Methods of Data Collection:** (i) Questionnaire Administration: A set of structured questionnaire was administered on 15 members in each site. This gave a sample size of 75. (ii) Focus Group Discussion (FGD). One FGD was conducted at each study site.

- (iii) Cassava Cooperative Societies were identified in each of these communities. The structured questionnaire was administered on 15 members in each of the groups. This gave a sample size of 75. Each of these cooperatives has existed for more than 10 years and their members have been involved cassava cultivation, processing and marketing. They were thus considered to be sufficiently knowledgeable in matters relating to cassava Ikot Eyo
- (iv) Data Collection Methods: A set of structured questionnaire was administered on 15 members in each site. This gave a sample size of 75. Each of these cooperatives has existed for more than 10 years and their members have been involved cassava cultivation, processing and marketing. They were thus considered to be sufficiently knowledgeable in matters relating to cassava Ikot Eyo

## METHODS OF DATA ANALYSIS

The study which culminated in this paper was conducted in Akwa Ibom State, Nigeria. The approach adopted consisted of collection of both primary and secondary data. The primary data were collected through the use of structured questionnaire supplemented with Focus Group Discussion (FGD). First, 5 dominantly cassava producing communities were identified through record provided by the Akwa Ibom State Agricultural Development Project (AKADEP) for study. These were Ikot Eyo in Nsit Ubium Local Government Area, Mbiaya in Urua local Government Area, Ikot Abiyak in Itu Local Government Council, Idu Uruan LGA and Ikot Ataku in Eket local Government Area. Second, cassava cooperative societies were identified in each of these communities. The structured questionnaire was administered on 15 members in each of the groups. This gave a sample size of 75. Each of these cooperatives has existed for more than 10 years and their members have been involved cassava cultivation, processing and marketing. They were thus considered to be sufficiently knowledgeable in matters relating to cassava processing. Ikot Eyo Multipurpose Cooperative Society has about 100 hectares of cassava farm which is highly mechanized. Its members have been trained and have participated in many cassava development programmes by either State or Federal Government or International Agencies. All the cooperative societies selected were also used as pilot communities for the Akwa Ibom Cassava Competitiveness Project. The data sought from the respondents were on the cost of processing cassava into the three popular cassava products in Nigeria namely garri, foofoo and flour. The revenue accruing to these processes were also obtained. Data obtained through the questionnaire were complemented with qualitative data from Focus Group Discussions. One FGD was conducted at each of the sites. This was employed to probe further, in a group context, the information provided by individual respondents.

Secondary data were obtained from various sources namely AKADEP, cassava related website (various),

**Data Analysis:** The data obtained were subjected to gross margin and profit analyses.

The Gross Margin analysis attempts to show the excess of revenue over total variable cost only. In estimating the gross margin, only the variable cost items are considered. Thus the formula employed in this study was:

$$GM = \sum_{i=1}^n (P_{y_i})(Y_i) - \sum_{j=1}^m C_{x_j}$$

where GM = Gross margin,  $P_y$  = unit price of output  $i$ ;  $y_i$  = output of product  $i$ ;  $C_{x_i}$  = unit price of input  $x_j$ . The gross margin analysis is expected to reveal the profitability of each enterprise in the short run. We went further to estimate the net profit for each of the processed cassava products. The net profit was computed as the difference between total revenue (TR) and total cost (TC). The total cost include both variable cost items and fixed cost items. The formula of the net profit is:

$$\Pi = TR - TC$$

Where TR = total revenue; TC = Total Cost;  $\Pi$  = Profit

It is assumed that the fixed cost items could have some impact on the profit level of an enterprise. And that a rational entrepreneur would select the most profitable enterprise.

Thus, among the array of products which cassava can be processed into, it is the one with the highest level of profit that would attract the interest of the entrepreneur.

## RESULTS AND DISCUSSION

### i. Comparison of the cost of processing cassava into flour, starch and chips:

Tables 1, 2 and 3 contain the variable cost items required for the processing of cassava into cassava flour, starch as well as chips. The unit prices (2001), the quantity of each item required for a one-ton-per day and the total cost as well as the percentage contribution of each item to the total variable cost is presented. For the three products, raw cassava tubers make up more than 50% of the total variable cost. The cost of marketing is the next in magnitude. The cost of water is the least in all cases. It is evidenced from the result that the availability of sufficient quantity of cassava tubers is essential for the production of cassava flour, starch and chips. The importance of marketing is also essential in the production of these products. The important cost components in adding value to cassava tubers to obtain these products should be noted by a potential entrepreneur. They could be critical to the success or otherwise to a processing outfit that venture into this line of business. It needs be added that the prices on which these estimates were made are year 2001 prices. To obtain the current situation, the values need to be extrapolated. The total variable cost of processing cassava tubers into each of the product is of interest. Among the three products, the highest processing cost is incurred in starch processing. This is followed by cassava chips and lastly by cassava flour. Comparatively, the cost of processing cassava tubers to starch is higher by N9075 to processing to cassava flour. This is equivalent to 32% of the total variable cost of cassava flour production. In the same cost of producing one ton of starch is higher than that of producing chips by N8250 (or 28% of total variable cost of chips production). This implies that considering only the variable cost production, it is cheaper to produce cassava flour than either chips or starch and it is also cheaper to produce cassava chips than starch.

### ii. Gross Margin in processing Cassava products into cassava flour, starch and chips:

The gross is one of the short run measures of the profit level in a business. It considers the return that accrues to investment within the time frame when some production inputs remain fixed or unchanged. Evidence from this study is that the higher the cost of production, the higher the gross margin. Starch production which attracts the highest cost among the three products under consideration also attracts the highest revenue. The reverse is also true. However, worthy of note is the level of gross margin over total variable cost. Taking away the investment in fixed cost items, an investor is bound to realize more than 200% of his/her investment in converting cassava tubers into cassava flour, starch or chips. However, since investment in fixed cost is very important in the initial period of investment, we consider this in the next section.

#### (i) Net Profit in Processing Cassava tubers into Cassava Flour, Starch and Chips

Net profit was obtained by considering the fixed cost items in addition to the variable. This gives the total cost outlay of processing cassava tubers into cassava flour, starch or chips and would be of interest to entrepreneur wishing to set up a processing outfit dealing with any of these products. A solar dryer facility was considered appropriate technology given its reliability and other desirable attributes (its comparison with relying on public power supply in Nigeria was however, not the focus of this paper).

Of all fixed cost items, the solar dryer constitutes more than half the total fixed cost in all the enterprises (Table 4). Comparatively, processing of cassava tubes into flour requires more fixed inputs than any of the other two. While diesel engine ranks second in cost magnitude to solar dryer in cassava flour and starch production, chipping

machine is however the second most important fixed cost item in cassava chips production. In terms of revenue, the highest revenue accrues to starch production while the least revenue is obtained from chippings production. The highest net profit was obtained from cassava chips production. Given the investment requirement in terms of variable and fixed cost items an investor can make a choice in which portfolio to put his or her resources.

#### **Implications for Industries and Policy:**

The findings of this study have several implications for cassava and agro processing industry as well as policy in Nigeria. In the first instance, given that cassava is mostly consumed in Nigeria in the form of *garri* and *fofofo*, the report presented here should be of interest to investors who might be interested in utilizing opportunity provided by government policy on cassava export drive to invest in this area. The fact that starch yields the highest net profit should encourage investment in this direction. The prime position occupied by raw cassava tubers in the cassava processing industries requires rigorous policies and programmes to increase cassava production to meet both immediate need for consumption processing into industrial products for national use and exports. This should also be a booster to cassava farmers to produce more to meet the increase demand for cassava for production of starch and chips for industrial use and export. Again the importance of solar dryer is worthy of note. It will require making this technology less expensive in addition to being readily available to encourage resource-poor farmers to participate not only cassava production but also processing. Finally, the fact that processing cassava tubers into any of the three products is profitable justifies the government initiative aimed at boosting cassava production in the country. This effort should be deepened and sustained.

#### **REFERENCES**

- Biancha C. C. and R. A. Garcia (2007) Export Marketing Strategies of a developing Country: An Exploratory Study of the Main Challenges and Success factors for Chilean Food Exports. *Journal of Food Products Marketing*. 13(3): 117
- Citizens International and New Nigerian Foundation (2001) Cassava Competitiveness; From Design to Implementation. Presentation to Akwa Ibom State Government, Uyo
- Jones, W.O (1959) *Manioc in Africa*. Stanford University, Stanford, CA. 315p
- Oluwole, O. B. and F.S. Adeyemo (2001) Commercial Production of Cassava Chips. A paper presented at a Workshop on Techno-Economic Feasibility of cassava Chips for Export. Victoria Island, Lagos
- Pantoja, J. (2001) Competitiveness Strategy for Cassava. Presentation at a Workshop on An Integrated Competitiveness and Feasibility Analysis to Develop Competitive Cassava Activities in the Rivers State Area, Port Harcourt.
- Peter, M. A. (2004) Fresh Cassava Tubers marketing: Perspective of Processing in Nassarawa State South Senatorial Zone. 38<sup>th</sup> Proceeding of Agricultural Society of Nigeria. Pp 272.