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# Growth of agro-enterprises in developing countries: The case of cassava processing enterprise in Nigeria

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## Abstract
Efforts to reduce the problems of hunger and poverty in Africa have been directed to increase agricultural production by using market-oriented strategies with mechanisms to adjust production and processing to specific demands and signals from the market. One of these mechanisms is the establishment of agro-enterprises that can contribute to increased employment opportunities, food security, and income in rural areas. The objective of this paper is to describe the general characteristics of an approach to create agro-enterprises in developing countries, using the data of cassava agro-enterprises in Nigeria. In addition, the paper analyzed how marketing strategies can affect the sales volume of these enterprises. Some policy mechanisms to promote the cassava sector in Nigeria are also discussed. A survey was done in both micro- and small-scale enterprises involved in cassava processing. Primary data were used to elicit relevant information from 66 processing centers owned by co-operatives/women's groups. The President and/or Secretary of each co-operative/women's group (owners of the cassava processing centers) were interviewed. The data collected included among other details, information on the social-economic characteristics of the owners of the processing centers and quantity produced in kilograms per year. Nigeria is characterized by a variety of forms of cassava agro-enterprises, ranging from micro-enterprises, composed mainly of either women or mixed group members, to the small/medium-scale enterprises with about 20 employees, on average. The data analyzed in this study show that distance to the source of raw material and the availability of cassava tubers for the enterprises were major determinants for maximizing revenue in cassava agro-enterprises in Nigeria.

**Key words:** Cassava, agroenterprises, Market, Processing equipment

## Introduction
Efforts to reduce the problems of hunger and poverty in Africa have been directed to increase agricultural production by using market-oriented strategies with mechanisms to adjust production and processing to specific demands and signals from the market. One of these mechanisms is the establishment of agro-enterprises that can contribute to increased employment opportunities, food security, and income in rural areas. The dynamic role of agro-enterprises as engines of growth in developing countries has long been recognized (Daniels, 1992; Daniels & Fisseha, 1992; Daniels & Ngwira, 1993). Agro-enterprises can drive rural development and increase agricultural productivity to meet social goals of poverty reduction, economic growth, and environmental conservation.

According to Eychenne, et al (2001), agricultural producers are now directly confronted with international competition. The end of price stabilization measures, the opening to imports, the suppression of subsidies for inputs and the dismantling of public support measures for the rural sector, have led to a more competitive and unstable environment.

Many small farmers in the rural areas of developing countries have migrated to urban areas. Those who have stayed behind have begun to diversify rural livelihood strategies beyond production to include both farm and non--farm income sources. According to recent work in Latin America, some 40% of rural incomes are now non-agricultural (Berdegue et al., 2000) while up to 80% of the value of final products is a result of postharvest processing and marketing

Nigeria grows more cassava than any other country in the world. Its annual production is currently put at about 34 million t. The market for cassava can be divided into two categories: the traditional food-oriented market and the new emerging market for cassava for industrial processes. In 2002, cassava suddenly gained national prominence following the pronouncement of a Presidential Initiative. that cassava be used as the engine of economic growth in Nigeria. The creation and development of cassava agro-enterprises in Nigeria can help to achieve this goal because cassava can be used to improve rural and urban incomes if investments in the downstream cassava sector or industry are made more effective.

The agro-enterprise sector accounts for almost two-thirds of rural industries. The current level of development of the agro-enterprise sector in developing countries is not evenly distributed, either geographically or between the sub sectors of the agricultural sector (McKenzie, 1998). In general, the development of the agro-enterprise sector can be categorized as being at an extremely low level. As an example, currently, agro-enterprise contributes a value-addition of only about 25% of the value of primary agricultural production in Viet Nam (Keddie and Binh, 2000).

Therefore, the development of rural industry and agro-enterprises has the potential to play a vital role in socioeconomic well-being and the improvement of the rural economy of Nigeria. This can occur through a number of factors. First, government policy towards the rural sector should be concentrated on improving the productivity levels in agriculture. Any increases in productivity in the agricultural sector could lead to increased levels of labor availability in rural areas and rural industries, producing labor intensive products, can absorb this surplus of labor. Secondly, the development of rural industries has the potential of increasing rural income levels compared to urban incomes by increasing the percentage of rural household income gained from off-farm activities. Thirdly, with increases in rural income levels, driven both by increased productivity and the effects of rural industrialization, there may be a strong growth of other consumer demand-driven rural industries, predominantly in the form of rural small industrial enterprises.

There are wide varieties of agro-enterprises and these account for almost two-thirds of rural industries in developing countries (McKenzie, 1998). Agro-enterprises are active in sub sectors such as the processing of food crops, animal products such as milk, and cheese, and confectionary items such as sugar and honey, the production of poultry feed, and other similar activities.

The level of development of agro-enterprise in developing countries is still low; but appears to be rising very quickly (Keddie and Binh, 2000). Food processing currently constitutes the bulk of agro-enterprises in Nigeria, and value-adding in food processing has been predicted to be on the increase. According to Dien (2000), the share of rural industry in the rural economy in developing countries has increased from 14% in 1996 to around 25% in 2000, while the share of rural services in the rural economy has increased from 15% in 1996 to around 25% in 2000. Therefore, the development of rural industry and the agro-enterprise sector has the potential to play a vital role in the future improvement of the rural economy of developing countries and also in the socioeconomic development of the nation as a whole.

In Africa, total cassava consumption has more than doubled in the last 30 years, (FAO, 2001). This large increase is due to a significant increase in per capita consumption in countries such as Nigeria and Ghana where cassava is produced as a cash crop for urban markets. The availability of cassava in a convenient food form, such as gari, plays a major role in the increase in per capita cassava consumption in Nigeria and Ghana. This suggests the need for enterprise creation and development in developing countries, especially in Nigeria, the world's largest producer of cassava.

An important component of market-oriented strategies for agro-enterprises is the development of marketing variables that are under the control of the enterprise, and are managed to obtain the desired response from the marketplace. A marketing strategy is designed to create and nurture a differential advantage. The marketing mix forms the center of a marketing strategy. The essential is to create in the customer's mind an idea that a particular product is different in an important way, so that the product will have a competitive edge over others in the marketplace. The most common variables (The 4Ps) used in constructing the marketing mix are price, promotion, product, and distribution (also called placement).

A product should satisfy a specific need or a want; it should possess good quality characteristics, packaging, and a size that appeals to consumers. Value addition to cassava products enhances the monetary value attached to them and the price they

command in the marketplace. A product strategy often encompasses the concepts of product management and brand management. Product and brand management are concerned with the attributes, image, and personality of a specific product. For example, the decision whether to make yellow or white gari, based on a consumer's specification, is a product-related decision.

This paper, therefore, seeks to discuss the general characteristics of an approach to create agro-enterprises in developing countries, using the data of cassava agro-enterprises in Nigeria. In addition, the paper analyzed how marketing strategies can affect the sales volume of these enterprises. Some policy mechanisms to promote the cassava sector in Nigeria are also discussed.

Materials and Methods

The study was carried out in the South-South and South-East areas of Nigeria from August to December of 2008. A survey was done in both micro- and small-scale enterprises involved in cassava processing. Primary data were used to elicit relevant information from 66 processing centers owned by co-operatives/women's groups. The President and/or Secretary of each co-operative/women's group (owners of the cassava processing centers) were interviewed. Data collected included information on the socio-economic characteristics of the owners of the processing centers and quantity of cassava products produced in kilograms per year.

The methods of data collection were multistage random sampling and purposive sampling. The first stage of the exercise entailed random selection of three local government areas (LGA) from each State in the study area. The second stage entailed purposive selection of three gari processing enterprises from each LGA, because these processing enterprises were not evenly distributed. The number of the processing centers surveyed added up to 108. However, only 90 questionnaires were used for analysis.

Correlation coefficient, ANOVA, and principal component analysis were used to establish the relation between variables. Eight explanatory variables were used to explain the movement/year of the output. The explanatory variables are average age of the business owners, years of schooling, distance to source of raw material, availability of cassava, use of improved varieties, processing experience (in years), selling experience (in years), and access to market. In addition, cross-sectional data on sales volume, as well other marketing factors influencing sales (such as price, product quality, marketing channels, product promotion, and processing technology) were collected from micro- and small-scale gari processing enterprises in the study area.

Multiple regression analysis was used to analyze the factors influencing the marketing of gari in the study area. Many functional forms of the model were tried, but Logarithm function was found to be appropriate because of its fitness.

The model was specified as:

$$Y = a + b1X1 + b2X2 \ldots\ldots bnXn + e$$

Where:
a: constant
Ln Y = Volume of Sales in Naira (Nigerian Currency);
Ln X1 = Quantity of Product (t);
Ln X2 = Price of 1kg of gari;
Ln X3 = Quality of the product (Ranked from 1 to 3);
Ln X4 = Marketing Channels (Ranked from 1 to 5);
Ln X5 = Packaging (Sales Promotion, Ranked from 1 to 5), and
Ln X6 = Level of technology (Two levels: 1 = Traditional e 2 =.Improved technology)

The preliminary expectation from this model is that adequate knowledge of these variables will help in predicting cassava enterprise sales performance so that efforts to improve the sales prospects of agro-enterprise firms can be well focused.

## Results and Discussion

Characteristics of Cassava Agro-enterprises in Nigeria

The managers/operators of cassava agro-enterprises were male, with an average age of 42 years, and had about 13 years of formal education with little or no managerial experience. Relatively few of the managers/operators had a background in agriculture and this was expected to have some influence on the output of each processing center.

The average land area owned is somewhat large and varies considerably among cassava enterprises of different sizes. Ownership of land and structures was relatively high and acquiring land and buildings could be quite problematic. Overall, all the cassava agro-enterprises surveyed had difficulty in acquiring land and buildings, though the type of problem differed somewhat, depending on the size of the business. However, the problem of finding a technically suitable site was a common problem.

The cassava agro-enterprises employed varying numbers of workers, from 1 to 5 people in a micro-enterprise to as many as 20 in the small-scale enterprise. The majority of the labor for the enterprises came from part-time workers, who provided an average of 10.5 persons/enterprise. Full-time workers accounted for an average of 4.2 persons per enterprise. The ratio of female to male in the work force was 3:1. This result is consistent with many studies of the rural industrialization process, which have cited the potential for rural enterprises to concentrate on labor-intensive industries. Labor-intensive production by agro-enterprises is seen as a vehicle for absorbing surplus labor in rural areas, bringing competition to the domestic market, and generating rural savings (Mckenzie, 1998).

The cassava agro-enterprises surveyed used a variety of technology in their processing businesses. The primary source of the machinery, equipment, and tools used by the enterprises was indigenous fabricators in Nigeria. This pattern prevailed across all the enterprises surveyed. Therefore, the level of technology currently adopted by the enterprises was still low.

The source of supply for the enterprises varied considerably, depending on the size of the business. The main source of supply of fresh cassava tubers for micro-enterprises was from individual farms of less than 5.0 ha, very close to the location of centers. By contrast, small-scale enterprises were less dependent on supplies from individual farms since they needed to accumulate larger quantities than the micro-enterprises. More of the cassava agro-enterprises surveyed obtained their fresh cassava tubers within 10 km of the enterprise's premises. Some of them obtained their raw material from sources within 20 km. Small-scale enterprises are most likely to use more distant sources of raw material. Therefore, as the size of the enterprise increases, the average distance to suppliers of the raw material increases.

The contributing factors to the realizable output per year from the surveyed cassava enterprises were availability of cassava tubers, distance to the source of raw material, use of improved varieties by farmers, and experience in processing techniques (Table 1). However, analysis of variance using only micro-scale processing enterprises (Table 2) revealed that distance to the source of raw material and availability of cassava tubers were contributing factors to the realizable output.

Table 1: Analysis of variance using data from micro and small-scale processing centers
Significant at 5% level

| Variable | Coefficient of Variance | Root Mean Square (MSE) | R - Square | F - Value |
|---|---|---|---|---|
| Age (years) | 8.871 | 3.605 | 0.3954 | 1.47 |
| Years of schooling (years) | 30.952 | 3.137 | 0.2253 | 0.65 |
| Distance to source of raw material | 17.321 | 0.4094 | 0.7733* | 2.36 |
| Availability of cassava tubers | 43.899 | 0.3459 | 0.5119* | 2.36 |
| Use of improved varieties | 76. 695 | 0.4531 | 0.4207* | 1.63 |
| Experience in processing | 24.094 | 0.9492 | 0.4503* | 1.84 |
| Experience in selling | 19.183 | 01.616 | 0.3883 | 1.43 |
| Market access | 26.163 | 0.8246 | 0.3418 | 1.17 |

Table 2. Factors contributing to realizable output from cassava enterprise

| Variable | Coefficient of Variance | Root Mean Square (MSE) | R - Square | F - Value |
|---|---|---|---|---|
| Age (years) | 8.869 | 3.607 | 0.3463 | 1.67 |
| Years of schooling (years) | 30.324 | 3.049 | 0.1835 | 0.71 |
| Distance to raw material | 18.566 | 0.422 | 0.7477* | 9.35 |
| Availability of cassava tubers | 43.784 | 0.334 | 0.5383* | 3.68 |
| Use of improved varieties | 66.888 | 0.438 | 0.3 681 | 1.84 |
| Experience in processing | 24.676 | 0.947 | 0.3613 | 1.78 |
| Experience in selling | 19.125 | 1.582 | 0.3776 | 8.27 |
| Market access | 24.869 | 0.800 | 0.2577 | 1.10 |

The results revealed some degree of relationship between these variables and the output per year. The shorter the distance to the source of raw materials, the more ready the owners are to embark on business. This has a positive influence on the output. Again, the less problem with availability of cassava tubers, the better the chance of the output per year.

The principal component analysis showed that output from cassava agro-enterprises was affected by three principal components with distance to source of raw material and availability of cassava tubers having a stronger influence in all the components.

**Marketing Strategies as Development Tool for Agro-Enterprises**

In the micro-enterprises, marketing could be categorized as passive, with the enterprises selling mostly to local customers or to traders who came to the enterprise to buy and then resell the products to more distant markets about which the enterprises themselves knew very little.

It was difficult to differentiate the quality of gari because it is prepared to the taste of the consumers, and this differs across ethnic backgrounds. Therefore, gari was ranked as being of low quality when prepared for local consumption and of medium quality when it was prepared in a form that would be generally acceptable by people from all ethnic backgrounds. Gari specially packaged for restaurants and hotels, was ranked high quality.

The majority of gari processors sold their product at their processing site and they were not inclined to undertake product promotion. Demand for the product was high and consistent throughout the year because it was the major staple consumed in the study areas.

The explanatory variables such as quantity, price, quality, marketing channels, promotion, and type of technology employed, explained 84.40% of the total variation in the volume of sales of the enterprises in the study areas. Amongst these variables, product price, quantity produced, quality of product, and numbers of marketing channels took on positive signs, meaning that they were directly related to sales volume. This was, however, consistent with the expectations and indicates that an increase in any of these variables would lead to an increase in the sales volume of an enterprise, and vice-verse. This means that an enterprise would make more sales if it sold high quality product (gari) in as many channels as possible and at a price that the consumers were willing to pay. Meanwhile, the better the technology employed by the enterprise, the higher the quantity of products and, eventually, the sales. Conversely, the negative sign on the coefficient of variable X5 (product promotion) depicts that gari for now, does not require sales promotion because there is a ready market for it.

Thus the model is:

$$\text{Ln } Y = .3930 + 1.051\ X1 + .3100\ X2 + .1610\ X3 + .2710\ X4 - .2970\ X5 + 1.178\ X6 + E$$

$$R^2 = .844$$

The result of the analysis of variance showed that all the variables in the model were significant at 5% and 1% level of significance, thus they were all important in predicting the volume of sales of the cassava agro-enterprises studied.

## Conclusions

This study showed that the development of a commercialized agriculture rests on the growth of micro to small enterprises that go beyond employing mainly family members. The development of such a "corporate" cassava agro-enterprise structure in Nigeria is still at its very beginning. The major constraints were related to access to suitable land, access to capital, technology, marketing, and infrastructure. The primary land-related constraint for agro-enterprises in Nigeria has to do with the difficulty that enterprises have in obtaining a sufficiently large and technically appropriate site with good access to clean water, electricity, and road infrastructure from which to undertake their processing operations.

Nigeria is characterized by a variety of forms of cassava agro-enterprises, ranging from micro-enterprises, composed mainly of either women or mixed group members, to the small/medium-scale enterprises with about 20 employees, on average. The data analyzed in this study showed that distance to the source of raw material and the availability of cassava tubers for the enterprises were major determinants for maximizing revenue in cassava agro-enterprises in Nigeria

There is some evidence that agro-enterprise development is gradually transforming agriculture and rural communities in developing countries. As a result, farmers and entrepreneurs need to change the way they do business. They have to think about how to organize themselves for market-oriented production and to be more attentive to market signals and opportunities. This, in essence, lies within the

expected benefits from creation and development of rural producer organizations as facilitators of knowledge transfer. Furthermore, a case study of cooperatives in Nigeria where a joint venture strategy enables producers to achieve higher returns on their products (Eychenne, et al., 2001).

The paper has shown that by developing strategic products through a comprehensive marketing plan will not only increase the viability of rural agro-enterprise in the form of high sales but will enable researchers, farmers, and policy-makers alike to see that the four Ps strategy (Product, Price, Place and Promotion) of marketing can be successfully applied to agro-enterprise development. Thus, market-oriented agricultural production and technological advancement can be a way forward to empower the rural poor and to alleviate poverty in Africa.

## Reference


Berdegue, J.A, Reardon, T., Escorbar, G., Echavervia, R (2000): Policies to Promote Non-Farm Rural Employment in Latin America. ODI Natural Resource Perspective. No. 51, June 2000. Washington DC, USA.

Cano, C.G (1998): IICA.ACT – Colombia, UN Proyecto de Desarrollo Agroempresarial, Sustitucion de Cultivos Ilicitos y Reforma Agraria Para la Paz. Coleccion Documentos IICA. Series Proyectos Especiales No. 1 Julio 1991.

Daniels, L and Ngwira, A (1993): Result of Nation Wide Survey on Micro, Small and Medium Enterprises in Malawi, Gemini Technical Report No. 53. PACT Publications, New York, USA.

Daniels, L and Fisseha, Y (1992): Micro and Small Scale Enterprises in Botswana: Result of Nation Wide Survey Gemini Technical Report No. 46, Washington DC, USA. Development Alternative Inc.

Daniels, L (1992): The Relevance of the Flexible Specialization Paradigm for Small Scale Industrialization Restructuring in Ghana, IDS Bulletin Vol. 23, No. 3.

Dien, N. (2000). Agricultural and Rural Industrialization in the 1996-2000 Period. World Economic Issues, No. 2.

Eychenne, D.; Hussein, K.; Losch, B.; Mercoiret, M.; Rondot, P.; Macintosh-Walker, S.. (2001). Reaching the rural poor. The Role of Rural Producers Organizations (RPOs) in the World Bank Rural Development Strategy. Available at: http://www.worldbank.org/afr/wps/wp44.pdf. Accessed in Aug. 15 of 2010.

FAO. (Food and Agriculture Organization of the United Nations) (2001): Raising Women's Productivity in Agriculture. In :The State of Food and Agriculture 2001, 58-71. FAO, Rome, Italy.

Keddie, J. and Binh, T.Q (2000): Agroindustry Specialist Report, TA 3223-VIE, June 2000. Asian Development Bank. Vietnam.

McKenzie, J (1998): "Presentation on Rural Industrialization" to Joint Vietnam Ministry of Agriculture and Rural Development and World Bank Workshop on Vietnam Rural Development Strategy, Vision to Action: Rural Development Trends and Priority Issues. Hanoi, Vietnam, April, 22/1998.