

CHAPTER 9

AGRO-FOOD CHAINS AND SUSTAINABLE LIVELIHOOD

A case study of cassava marketing in Nigeria

OLUSOLA BANDELE OYEWOLE AND BIOLA PHILLIP

Research and Development Centre (RESDEC)

University of Agriculture

P.M.B. 2240, Abeokuta, Nigeria

E-mail: solaoyew@hotmail.com; oyewoleb@yahoo.com

Abstract. Cassava is a good example of problems that local producers encounter in developing agro-food chains aiming at added value and fair rewards for labour inputs. Low production at many small-scale farms lead to high transaction costs. Cassava spoils easily and is costly to transport in its raw form as it consists mainly of water. Therefore much processing takes place on-farm. Processing results in *Gari*, *Lafun* and *Fufu* products with longer shelf life than cassava roots. These products are consumed in the household or sold in the local market. Middlemen buy these products to sell them to urban or international consumers. The products can also serve as basis for further industrial processing but this option is under-exploited so far. It is a highly competitive market with fairly uniform products priced according to the demand–supply principle. Formal quality control is missing. The largest share of added value goes to secondary processors and middlemen. Organizing farmers and training them in entrepreneurship skills is needed to improve their bargaining position and their production and processing process. Policy should provide an enabling environment in terms of banking facilities, quality regulation and control, etc., to support the entire chain. It can support increase in scales of processing at farmers' level, increase in investment in the chain, and promote closer and more sustainable interaction between producers, processors, salesmen and consumers in an agro-food chain.

Keywords: local foods; market structure; banking, labour; processing; organization

INTRODUCTION

Agricultural production in Africa is not very productive per unit of land and unit of labour. It is constrained by lack of access to land, poor technology and harsh environments in terms of low soil fertility, erratic rainfall and fragile ecosystems. On top of that it suffers from marketing constraints. Developing an agricultural produce that is attractive for local or international markets requires quality:price ratios that are competitive. Low population densities are not conducive for extensive

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infrastructure in terms of roads, transport possibilities, financial services and provision of affordable inputs at producers' level etc. It is very difficult to achieve economies of scale. Transaction costs of agricultural produce are high. Importing produce from Europe into African urban centres may be cheaper than producing locally and transporting over large distances to these centres.

The majority of African smallholders cultivate less than two hectares of farm lands, use rudimentary tools and lack access to processing machines. Lack of appropriate storage facilities prohibits to a great extent the ability to accumulate produce till it becomes a batch that is sufficiently large and attractive to enter a supply chain. Many of these farmers lack organization in producers' organizations and product quality evaluation and are therefore difficult to include in international food chains. In the international context much agricultural produce from developing countries finds it difficult to enter today's international market due to the set quality requirements. Agricultural produce largely remains on farm or goes to nearby local markets.

To provide insight into the problems confronting agricultural product marketing and food chains in Africa the example of cassava marketing in Nigeria is used. Special attention is given to street foods and local market operators.

CASSAVA CASE

Cassava (*Manihot esculenta* Crantz) is a very important crop in Africa and has recently become "the most important root crop in Nigeria" (Ugwu 1996). African countries produce over 81 million tons per year and Nigeria accounts for 45 million tons. Over 70% of production in Nigeria is consumed locally. Nigerian cassava production is by far the largest in the world; a third more than production in Brazil and almost double the production in Thailand and Indonesia (Phillip et al. 2004). However, Nigeria takes a small proportion, about 0.001%, of the world export market. Thailand is a big player accounting for 50% of the EU market. Price differences between 104 US dollars/ton in Nigeria against 21 USD/ton in Thailand reflect the difficulties in production and marketing circumstances in Africa.

Cassava is propagated by stem cuttings and thrives in fairly bad weather and poor soils with little or no fertilizer application. It can be harvested from 6 months to 3 years after planting and the roots can remain in the soil after maturity for more than six months before harvesting. In Nigeria cassava is cropped sole or in association (intercrop) with maize and vegetables. Cassava producers in Nigeria are small-scale farmers that number in their millions. Cassava is available all year round although the labour requirement for uprooting in the dry season is more than during the wet season. There has been a steady growth in cassava production in Nigeria from 12 million tons in 1986 to 31 million tons in 1996 with current production estimated at 34 million tons. This increase is fully due to an increase in number of hectares under cultivation. Average production per ha remained stable at about 11 tons (FMANR 1997).

Cassava forms a major part of the dietary intake of Nigerians, especially in southern Nigeria, and is said to have a daily per-capita dietary calorie equivalent of

238 kcal (Ugwu 1996). A few varieties of the species are eaten boiled but the bulk of the production is processed before utilization. This means that cassava root is not available in food stores or supermarkets. The most popular traditional processed consumer products from cassava include *Gari* (toasted granules), *Lafun*, *Fufu* and starch, while the semi-processed producer goods, i.e., industrial raw materials, are cassava flour, cassava pellets, tapioca, animal feed and industrial starch (UNIFEM 1989).

Producers of the consumer goods are farm families in most cases, and small/medium-scale entrepreneurs. Most farm families engage in cassava processing, firstly, as a way of providing food for the immediate use of the household, and secondly, to add value to the product in order to increase their farm income. Thirdly, cassava is bulky and unlike yam or other root crops it is not directly edible. The crop exhibits certain characteristics in terms of deterioration in quality of the produce if it is not immediately utilized. Its processing extends the shelf-life thereby reducing the risk of wastage and expensive cost of transportation over long distances. The focus of this paper is the marketing of cassava and its effects on the livelihood of the producers.

Structure of the market

Cassava marketing in Nigeria is a model of a competitive market and depicts the following characteristics. The operators are independent and decentralized in decision-making. They have fairly homogeneous products though some exhibit certain levels of price differentiation that Ikpi (2002) reported as having monopolistic tendencies. The general outlook is that the degree of competition in the market is fairly high; hence, we can safely describe the market as belonging to the perfectly competitive industry. Moreover, there exists free mobility of resources in the industry, and buyers and producers are well informed about the industry's activities. The focus of our analysis is on the number and size distribution of the buyers and sellers in the market, the product differentiation and conditions of entry. These variables are important determinants of the magnitude of power the operators have relative to others in the industry.

Cassava producers in Nigeria are independent. They are not unionized, neither do they have agencies that exert any form of control over the producers or marketers. Most of them are small-scale producers located in the rural areas of the country but predominantly south of the river Niger. There exist local and improved varieties of cassava and they differ mainly in terms of yield per hectare, resistance to pests and diseases and maturity dates. The products too are fairly homogeneous and very little attention is paid to coloration, sorting/selecting and even packaging. Buyers are equally large and have no forum to discuss or agree on prices. In essence, therefore, the principle of demand and supply is the key to pricing in this market. As cassava comes from many small units, each individual farmer has very little control over prices. The high dependency on weather and biological patterns of production implies that marketing agencies in the short run must adjust to farm supplies.

The cassava food chain

As an agricultural product, cassava is largely a raw material for further processing. The product soon loses identity and becomes food. It is bulky, and this single characteristic also has implications for physical handling in terms of haulage, that is, transportation cost, storage space and risk. It also has the tendency to have reduced quality if not processed soon after harvesting. All these have a lot of implications for the facilities necessary to market the crop at different stages.

Cassava is usually processed as follows. First the outer coating (cassava peel) is removed. The whitish part left is then thoroughly rinsed (washed) before the processing for *Gari*, *Lafun*, *Fufu* or other products starts. Many food products made from cassava in Africa are products of fermentation (Oyewole and Odunfa 1992). The duration and method of fermentation vary depending on the product under consideration. The fermentation processes serve to reduce the cyanide content of cassava and to impart palatability to the product and they also increase shelf life (UNIFEM 1989).

Fermented cassava flour (*Lafun*) is usually made from freshly harvested cassava roots. The roots are peeled and subjected to a fermentation and drying process. The drying process helps to increase the shelf life and reduces the bulkiness of the product. Milled dried fermented cassava root materials give the *Lafun* (cassava flour).

To produce *Gari* the peeled cassava is grated and the pulp is bagged and compressed to express the water while undergoing fermentation. The dewatered pulp is sieved and roasted. This reduces the bulk and weight and increases the shelf life. A well processed *Gari* can be stored for two years without adding preservatives. This product is easily transported to urban markets several kilometres away or as export commodity.

Two forms of *Fufu* are traditionally produced in Nigeria; wet *Fufu* paste and ready-to-eat *Fufu*. The third form is a recently produced *Fufu* powder. The peeled cassava is usually immersed in water to ferment. The water is pressed out and the pulp is pounded, wrapped firmly in leaves or nylon and steamed. The later processing method stops at the pounding, i.e steaming is not done. This means that the consumer would have to steam before serving. This is commonly transported to urban centres while the former is usually sold a few kilometres away from the point of processing. The shelf life of both forms of *Fufu* is about 9 days. The third method is the outcome of a recently concluded research work (Oyewole et al. 2001). *Fufu* powder has been test-marketed and is currently undergoing widespread publicity, large-scale production and commercialization.

These products (*Fufu*, *Gari* and *Lafun*) are processed mostly by the farmers themselves, and also by middlemen who buy fresh roots and process them into any of the products above. There are a few medium- or large-scale producers of *Gari*, but the bulk of *Lafun* and *Fufu* producers are small-scale. Though expensive to produce because it is labour-intensive and requires a high fuel-wood consumption, a high percentage of cassava roots produced in the forest and savanna regions of Nigeria are processed into *Gari* (Nweke 1994). There is no formal quality control on

cassava-based products or processing methods, neither with respect to nutritional quality nor on hygiene or other characteristics related to food safety.

The chain of marketing cassava products is indicated in Figure 1.

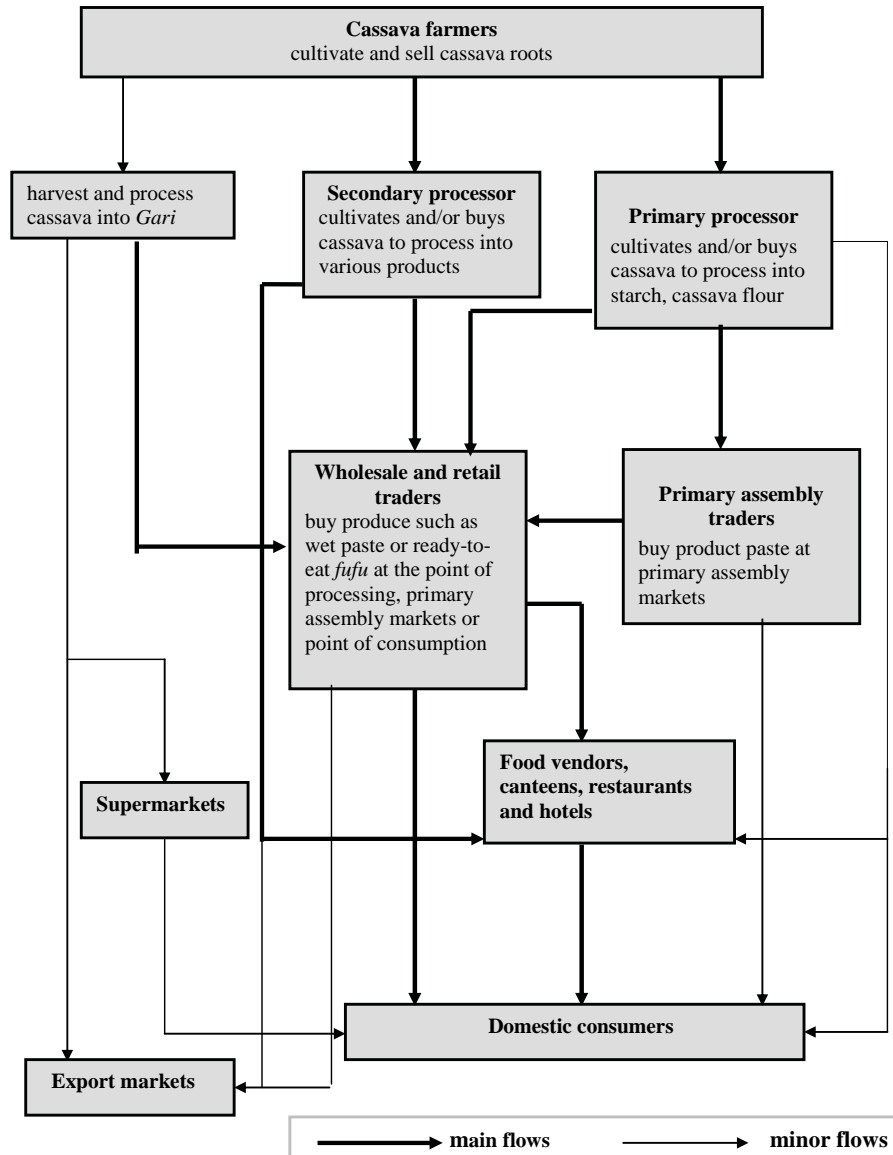


Figure 1. Typified marketing chains for cassava in Southwest Nigeria (modified after Dipeolu et al. 2001)

The primary processors are mainly farmers. The middlemen enter the chain as wholesalers and or retailers. Typically, the cassava roots are harvested and processed close to the point of harvest. The secondary processor adds value to it and then sells to wholesalers or retailers, before it gets to the local consumer or is exported to other countries.

The link between the cassava growers and the consumers of the finished products could be relatively short at times. As the cassava leaves the farm gate, it could be processed by the same farm family into *Fufu*, *Lafun* or *Gari*. These products could be sold in the village markets (or nearest market) by the producer herself to the final consumer. It is also possible for such products to be sold to middlemen. The middleman in turn will move such produce to the urban centre for retailing to the final consumer. At other times, some of these products could follow a fairly longer chain, e.g. *Gari*, as it travels over long distances from southern to northern Nigeria. In this chain, the middleman/-woman buys the product from the producers, packages it in bags, sorts and grades the product and transports it to the northern destination. At specific market locations/urban centres, the product is then sold to wholesalers and retailers to complete the chain.

The large-scale producers sell through wholesalers (distributors), who in turn sell the products to retailers before they get to the final consumer. A sizeable proportion of these are transported to Europe and other parts of the world to meet the demands of the Nigerian-cum-African population. Marketing of cassava products as industrial raw materials has remained largely unexploited in Nigeria. Research has shown that cassava can be substituted for grain in livestock feed production, as is done in parts of Latin America (Ugwu 1996). There are unexploited opportunities for the export of pellets, starch, glucose syrup and alcohol from cassava. Post-harvest utilization of cassava has moved to the production of industrial cassava flour. This process differs from that of cassava flour (*Lafun*) discussed earlier. Industrial cassava-flour production avoids fermentation. The processing can be done on a small or large scale. After harvest, the cassava is peeled, thoroughly rinsed, milled, dried, sieved and packaged. All harvested cassava has to be processed within 24 hours to obtain high-quality flour. The chain in industrial flour products could stop here, whereby the product is sold to factories that will use it as input for bakers (bread, pancake or biscuit), or the processing can continue for the production of glucose syrup or ethanol. These products are in turn sold to confectionaries, pharmaceutical industries and producers of alcoholic beverages (spirits). The final products are then sold to wholesalers and retailers to complete the chain (Figure 2).

A few organizations have intervened in cassava marketing. A report of the International Institute for Tropical Agriculture (Phillip et al. 2004) indicated that a commodity-system approach that integrates cassava production, processing and marketing is presently being put in place. The approach assists farmers in the rural areas to retain a high proportion of the value-added from processing cassava to high-quality flour. The final product is then sold to the baking industry.

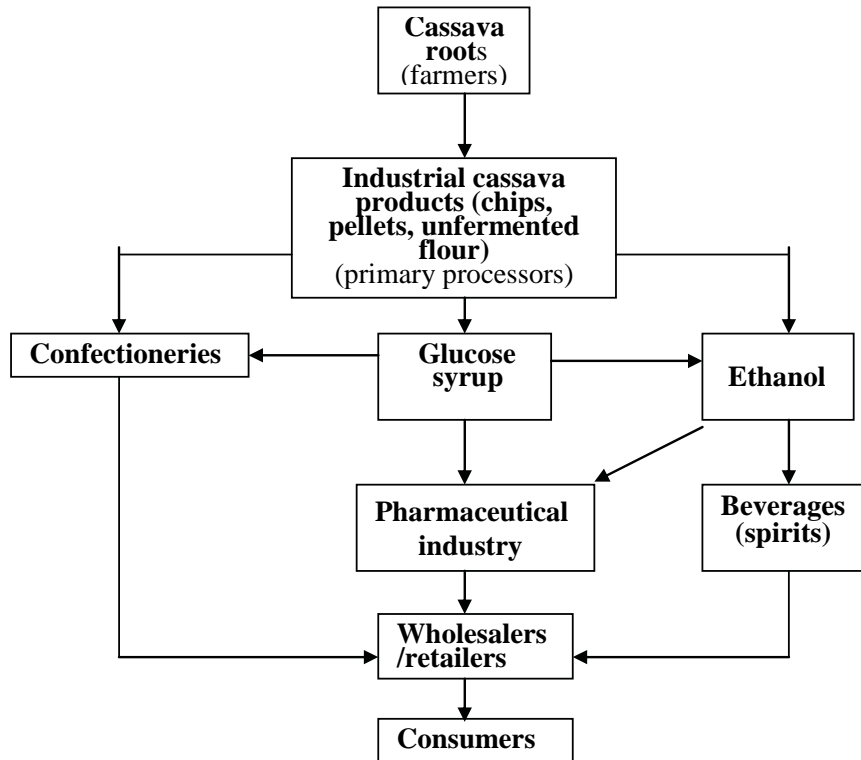


Figure 2. Typical market chains of cassava industrial products

Sustainable livelihood and economic development

The essence of marketing cassava-based products is to receive value for labour. At every stage in the cassava-processing chain, labour and materials are used up to add value to the product. The longer the chain, the larger the number of people involved in the process. Women constitute the major source of labour for cassava processing and marketing. They often buy cassava in the soil, they harvest, process and market. This increased earning opportunity enables them to purchase goods and services that contribute positively to their livelihood. According to Dipeolu et al. (2001), cassava generates the largest income for the largest number of farming households in Nigeria. About 34% of total household farm income in Ogun and Imo states and about 20% in Benue state are generated annually from cassava-related activities. The retailers of the *Lafun*, *Fufu* and *Gari*, the restaurant owners and the street food vendors who are involved in taking the finished product to the consumer also benefit in terms of better livelihoods. The benefits of wholesalers range from 20 to 50% and those for processors/retailers between 50 and 70% (Dipeolu et al. 2001). The

farmers, who provide most of the labour in the production chain, do not make as much profit as other actors in the chain.

The extension of the markets that derive from cassava processing and the marketing chain is an important part of economic development and sustainable livelihood. The markets enable the producer to exchange his products for income (credit/cash) which can be utilized to improve livelihood. Cassava processing provides employment to producers, transporters, processors, marketers and food vendors (Phillip et al. 2004). The local cassava-marketing chain has aided the development of product marketing. There have been noticeable improvements in marketing segments like grading, packaging (to enhance product durability) and storage. These resulted in quality products that attract better prices and enhanced income.

The continuous growth of the urban population coupled with some policies embarked upon by the Nigerian government has spurred up the demand for cassava products especially since the later part of the 1980s. To this extent cassava products are sources of food of great preference to rich and poor in urban and rural areas alike. An effective local cassava market chain fits to these growing demands. It has at the same time been a source of foreign-exchange savings for the nation as a whole (less food import needed). Moreover, it has earned the prominent position of the 'poverty alleviation crop' in terms of the diverse roles it plays in the economic life of the Nigerian economy.

Constraints to optimal utilization of cassava in Nigeria.

While there exists a large opportunity for cassava producers to earn good incomes and live comfortably, there is still a lot of poverty. The odds against maximizing the utility of cassava in Nigeria are many.

A sizeable number of the producers operate on a very small scale that could be considered economically non-viable. Their inability to analyse effectively the cost-benefit returns from the activity or a lack of proper machinery to dispose of the cassava produced might be the only reason why they are still engaged in the business. To this extent, if demand for cassava roots by large-scale firms exists, such farmers might rather sell their produce. For the moment the absence of large-scale firms that may take advantage of the economies of large-scale production further hinders progress in the cassava-producing chain.

Many producing areas still lack good communication networks. The bulk of the producers travel short distances to the nearest market (urban or rural) to dispose of their produce. Cost of transportation is still high and further reduces the profit margin of producers.

It has been observed that producers (farms) command a relatively low share of the wholesale and retail price and sometimes sell their produce on credit, at least in the *Fufu* market. Attention must be directed towards proper marketing of cassava products in Nigeria.

More importantly, an effective marketing system for cassava with the aim of promoting development must have a sound policy backing. As it were, the cassava

market is an unguided industry with operators behaving as they wish without reference to any guideline. The haphazard nature of the industry is partly responsible for its lack of development. Inadequate funding of research institutions to conduct research and the publication of results on problems identified by small-scale processors hinder coherent development in the industry.

CONCLUSION

What can be done to make cassava food chains an instrument of development? There are currently three major challenges: quality assurance, improved production and processing capacity and overcoming market limitations. In addition one might explore new or unexploited markets for the smallholders. To enter these markets smallholders and street food participants need to be integrated into agro-food chains and networks. When successful this will increase rural livelihoods. Yet, many things are needed to achieve product, process and marketing improvements.

To counteract the scale problems smallholder farmers need to organize themselves. Farmers' organizations such as processing cooperatives can also be effective in creating added value and reaping the benefits from it. To improve actual practices a system of continuous informal education is needed, especially training on quality assurance and marketing. A profitable cassava supply chain needs an enabling environment consisting of infrastructural support such as agricultural banking, agricultural insurance schemes, export promotion boards, etc. Regional partnership and international cooperation can be of assistance in shaping the circumstances for effective cassava supply chains and networks providing safe and nutritious products for local, regional or international markets.

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