

**Characterizing cassava marketing value chain in Kenya: A review**

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**Abstract**

This paper reviews the cassava value chain with an aim of characterizing the value chain by focusing on the marketing part of the value chain, the actors, and marketing channels. The data used in this review were obtained from secondary sources particularly books, journals, articles, conferences, theses and dissertations. The data were then analyzed by descriptive statistics. The results of the study indicate that the different forms of cassava products have different marketing channels and the longer the marketing channel of any given product the higher the price paid by the final consumer for that given product. Additionally, the results show that processing cassava increases its value, shelf life, and makes it possible to market cassava products in dispersed markets. However, production of cassava in Kenya is still low and inconsistent, the cassava value chain in Kenya is not well defined and there is little value addition along the chain. Therefore, the general conclusion of this review is that the Kenyan cassava industry is under developed and unexploited hence the government in conjunction with the private sector should put in place measures that would act as an incentive for investment in the industry.

Key words: Cassava, Kenya, marketing, value chain

**Résumé**

Cet article révisé la chaîne de valeur du manioc dans le but de caractériser la chaîne de valeur en se concentrant sur la partie marketing de la chaîne de valeur, les acteurs et les canaux de commercialisation. Les données utilisées dans cette revue ont été obtenues à partir de sources secondaires, particulièrement des livres, journaux, articles, conférences, thèses et dissertations. Les données ont ensuite été analysées par des statistiques descriptives. Les résultats de l'étude indiquent que les différentes formes de produits à base de manioc ont des canaux de commercialisation différents et plus le canal de commercialisation d'un produit donné est long, plus le prix payé par le consommateur final pour ce produit est élevé. De plus, les résultats montrent que la transformation du manioc augmente sa valeur, sa durée de conservation et permet de commercialiser les produits du manioc sur des marchés dispersés. Cependant, la production de manioc au Kenya est encore faible et non consistante, la chaîne de valeur du manioc au Kenya n'est pas bien définie et il y a peu de valeur ajoutée le long de la chaîne. Par conséquent, la conclusion générale de cette revue est que

l'industrie kenyane du manioc est sous-développée et inexploitée, d'où le gouvernement, en collaboration avec le secteur privé, devrait mettre en place des mesures qui inciteraient à investir dans l'industrie.

Mots clés: Manioc, Kenya, commercialisation, chaîne de valeur

## Introduction

Cassava (*Manihot esculenta*) is a starchy root crop and one of the most popular and widely consumed food crop in sub-Saharan Africa. According to Meridian Institute (2010) report, cassava has flexible planting and harvesting cycles, it can withstand drought and diseases and can do well in less fertile soils, thus this makes it a food security crop in Africa. In addition, a harvested cassava root weighs averagely between 0.5 kg to 2.0 kg and its length ranges between 15 to 100 centimeters. Westby (2008), projects world cassava utilization to range between 275 million tonnes and 291 million tonnes by the year 2020. However, the value addition of cassava in Africa is still low compared to other cassava producing states like Thailand. According to Meridian Institute (2010) report, 88% of cassava produced in Africa is consumed as food and only 50% of this is processed before being consumed. On the other hand, Thailand cassava industry statistics show that the industry is highly mechanized and most of the cassava produce is processed into animal feed and exported to Europe and China. According to KAPAP (2012) report, 90% of cassava produced in Kenya is consumed as food. Lack of processing of fresh cassava roots makes them vulnerable after harvesting because they are prone to physiological deterioration due to the high perishability and high levels of cyanogenic content which are the major challenges facing cassava marketing. This consequently leads to faster decline in the value of fresh cassava roots thus limiting opportunities of marketing fresh cassava roots from the point of production.

The value chain of any agricultural product starts from information gathering, input supply through to production, ending with consumption and disposal of the final product. Consequently, value chain analysis should include the supply and utilization of all factors of production, processing, storage, handling, transportation, marketing and distribution, aimed to deliver to specified destination, and finally consumption and disposal of the final product. The scope of a value chain as described by Gereffi (1994), can be broken down into five major components namely; the technical structure, the chain actors, the territorial structure, the input-output structure and the governance structure. According to Kaplinsky and Morris (2001), a value chain can be defined as “a full range of activities which are required to bring a product or service passing through the intermediate phases of production to delivery to consumers and final disposal after use”. A visual diagrammatic value chain can be represented as follows;



**Figure 1. A simplified value chain representation**

Figure 1 highlights the starting and ending points of a value chain which seems very long and broad to discuss in one paper. Therefore, this paper will only focus on the marketing part of the cassava value chain by discussing the actors, marketing channels and the marketing value chain.

**Marketing Value Chain.** Different approaches are used in value chain analysis though the aim of any given enterprise is to pursue one or more end markets. In some instances, participants along the value chain may integrate horizontally or vertically to take advantage of competitive advantage but in some cases, this may happen unknowingly (Aderibigbe, 2007). According to Nilofer (2009), the marketing value chain comprises five major components highlighting the movement of a product from the point of production through to the point of consumption.

Figure 2 is a diagrammatic representation of a simple Marketing Value Chain which is a process that starts after producing a given commodity to take to the market. Product management involves defining the specific markets and consumers that the product is targeting and developing a business model to facilitate marketing of the product. On the other hand, product marketing focuses on product positioning, valuing and differentiation while field marketing focuses on generating consumer interest and maintaining/ developing the business product channels. Lastly, brand management deals with consistency in providing the market with the best product experience in reaching consumer needs.

Marketing of fresh cassava is strictly local due to its perishability and low value/bulk ratio. Value addition through drying and processing increases its shelf-life making it possible for long distance marketing. In Africa, cassava is less much commercialized in the Eastern parts of Africa compared to the western parts of Africa (Meridian Institute, 2010). In addition, cassava is majorly consumed in its fresh form or processed using traditional methods that varies from one country to another. Marketing channels of cassava products are very dependent on value addition.



**Figure 2. A simplified marketing value chain representation**

**Marketing Channels.** A marketing channel is the path followed by a product from its point of production through to the point of consumption (Hay, 1975). Marketing channels are important in showing how different actors along the value chain are organized to ensure a smooth flow of products from their point of production to the point of consumption. According to Olukosi and Isitor (1990), marketing channels can be described using two broad categories, this is, centralized and decentralized channels. They explained that, a centralized channel involves products being moved from their different points of production to one established large central market place from where they are purchased by wholesalers, processors or retailers. In contrast, a decentralized channel is where wholesalers, processors or retailers move around purchasing produce directly from individual farmers. On the other side, while studying cassava commercialization in Southern Africa, Steven *et al.* (2012), describes the cassava marketing chain using six different channels which have been employed in this review.

**Channel 1. Farm household consumption.** Cassava, just like any other food crop, can be harvested, processed and consumed at the farm level. Therefore, cassava farmers may choose to practice either subsistence or commercial cassava production or both. A study by Abong *et al.* (2016) on cassava post-harvest practices, shows that all cassava farmers at the Coast, Eastern and Western Kenya, use cassava for household consumption and majority of these farmers also sell cassava products. According to the study, 19% of cassava farmers at the Coast, grew cassava for household consumption only. Another study by Steven *et al.* (2012) showed that 90% of cassava produced in Zambian and Mozambican annually is used for on-farm consumption while 70% of annual cassava production in Malawi was consumed by the farm household. On the contrary, only 15% of total cassava production in Nigeria was used for farm household consumption (Phillips *et al.*, 2004).

**Channel 2. Fresh cassava marketing.** Marketing fresh cassava means developing procedures of increasing the shelf life of fresh cassava roots. Otherwise, marketing of fresh cassava is only viable in high-concentrated setting where transport costs are low and short distances like in Malawi, because fresh cassava roots have a shelf life of three days after harvesting. According to IITA/SARRNET (2003), fresh cassava markets account for the majority of cassava markets in Malawi and fresh cassava markets are growing at a slow rate due to the long distance from cassava growing regions to the urban markets.

According to Meridian Institute (2010) report, fresh cassava can remain in the soil for quite some time after maturity. However, this method of storing cassava is ineffective and inefficient because the roots can turn woody, lose their flavor and be infected by pathogens as well it requires land to remain unproductive. Methods that mimic underground storage have been developed and include piling harvested cassava roots in mud and straw which also require a lot of space, and putting the roots in wooden crates with a plastic lining covered by damp sawdust. In Colombia, spraying fresh roots with fungicides and placing them in plastic bags has been successful in marketing fresh cassava at the retail level and in supermarkets. This technology helps to store fresh roots for 2-3 weeks and according to Westby (2008), this method has been adapted for use in Tanzania and Ghana. Westby (2008) also argues that other methods used for preserving fresh cassava roots like refrigeration, freezing and waxing are useful for the export market but are not suited for the domestic traditional African markets. A study by Mulu-Mutuku *et al.* (2013) showed that 100% of cassava farmers who engage in entrepreneurial activities, marketed their fresh cassava in raw form.

**Channel 3. Marketing of dried cassava roots and flour.** Fresh cassava roots can be sundried when in form of peeled cassava roots, cassava chips or cassava flour. According to FAO (2013), dried cassava roots (gapek) are stored or sold in market after cassava roots are peeled before slicing them lengthwise and then sun-drying. Sun-drying cassava roots is less labour intensive but it is less effective in removing cyanogen. It also increases the shelf life of cassava to between six to twelve months thus making it possible for long distance cassava transit through the complex marketing chains and storage/supply of cassava throughout the year. During dry periods of August and October in Zambia, according to Haggblade and Nyembe (2008), market sales of dried cassava goes up to 150 MT while in the cold periods like January, it goes as low as 20 MT. According to Steven *et al.* (2012), a large percentage

of cassava sold in the northern cassava belt and dual-staple zones of Zambia is in form of dried cassava roots and flour. Zambia exports dried cassava roots to the mining towns of Democratic Republic of Congo while dried cassava is sold in the coastal markets and to urban markets of Mozambique. The report also shows that, the selling price of dried cassava roots doubles their purchasing price when cassava is out of season. According to Abong *et al.* (2016), cassava flour and dried cassava chips are the most widely processed cassava products in Kenya and therefore the most widely marketed cassava products after processing.

**Channel 4. Processed foods.** There are different methods applied in processing cassava to different product forms. When cassava flour is not fermented, it can be used as a substitute to wheat flour in the confectionary industry. This type of cassava flour is prepared by peeling, washing, grating, pressing, disintegration, sifting, drying, milling, screening, packaging and storing cassava roots thus it is referred to as High quality cassava flour (HQCF). Farinha, a cassava product, is prepared in Brazil by roasting grated fresh cassava roots from which cyanide containing liquid has been squeezed out. In Africa, different procedures are used by different countries to process fresh cassava roots into different products such as gari and fufu in Nigeria, attiéké in Côte d'Ivoire and Benin, and chickwangué in Democratic Republic of the Congo (FAO, 2013). In the southern part of Africa, the main cassava processed food product is rale while in western Africa gari is the main processed food product from cassava. Rale is mainly produced in homesteads by women but small factories have emerged to process and package it well for urban dwellers and other retail markets (Steven *et al.*, 2012). At the Kenyan Coast, cassava is processed into cassava chips, cassava flour, cassava crisps, half-cakes and composite flour. In Eastern Kenya, cassava is mainly processed into cassava chips and cassava flour while in Western region cassava is mainly processed into cassava chips and composite flour (Abong *et al.*, 2016).

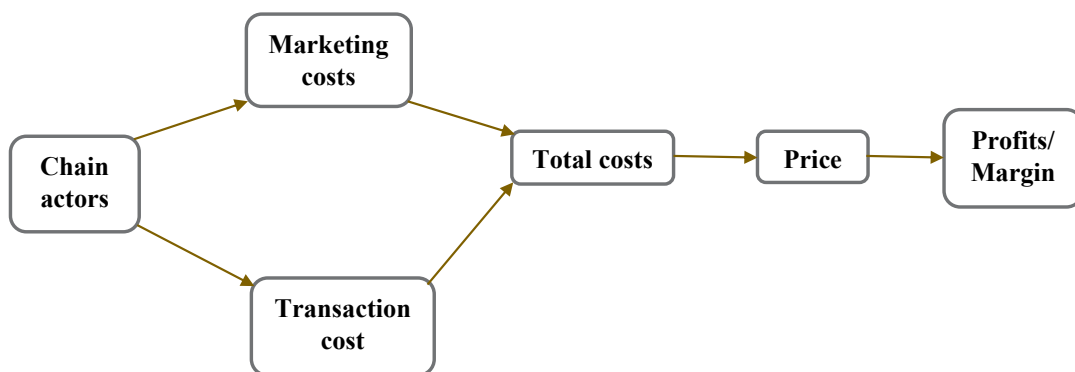
**Channel 5. Livestock feed.** Cassava livestock feed products are either consumed directly at the farm level or as processed products. Both the roots and leaves of the cassava plant can be used as on-farm animal feed or as an ingredient in commercial animal feed. However, fresh cassava roots or leaves are fed to livestock in small quantities because of their high cyanide content. Spreading the feed on the floor and leaving overnight releases some of the cyanide by evaporation. The feed can also be sun dried to remain with up to 14% moisture content or fermented to make silage for future usage. In southeastern Africa, Zambia is the leading processor of cassava livestock products due to almost immediate market of the products created by large commercial farming and livestock sectors. Farmers and companies in Zambia have highly experimented on with cassava-based feed rations as a means of reducing the cost of livestock production (Steven *et al.*, 2012). In Tanzania, according to Abass (2008), the demand for animal feed with 70% cassava components is estimated to be 5MT per day while that with 60% cassava components is estimated to be 20MT per day.

**Channel 6. Industrial products.** Industrial production of cassava-based starch, sweeteners and biofuels in cassava producing countries in the world has attracted both public and private interest. According to FAO (2013), countries such as Thailand and China have fully mechanized starch factories where daily output of cassava starch goes as high as 300 tonnes. Modified starch products are assimilated in food products or use as feedstock for production of sweeteners, fructose, alcohol and monosodium glutamate. In addition, modified starch is also used along with high quality cassava flour in the production of plywood, paper and textiles. Cambodia, China, Colombia, Thailand and Viet Nam, have already set up cassava-based fuel ethanol factories which are now operating. In

Africa, according to Steven *et al.* (2012), both medium and large-scale firms for industrial cassava production have emerged and this has taken the effort of both the public and private sectors. The first largest of these was set up in 1990s, a parastatal cassava starch company located on the Zambian Copperbelt but failed to pick up due to the collapse of government funding. Since then other firms have been set up in Malawi, Zambia and Mozambique for production of cassava-based starch, sweeteners and biofuels. Cargill, the world's leading manufacturer of food, has already set up 75,000-ton starch-to-sweetener plant in Nigeria (Cassava World Africa, 2014).

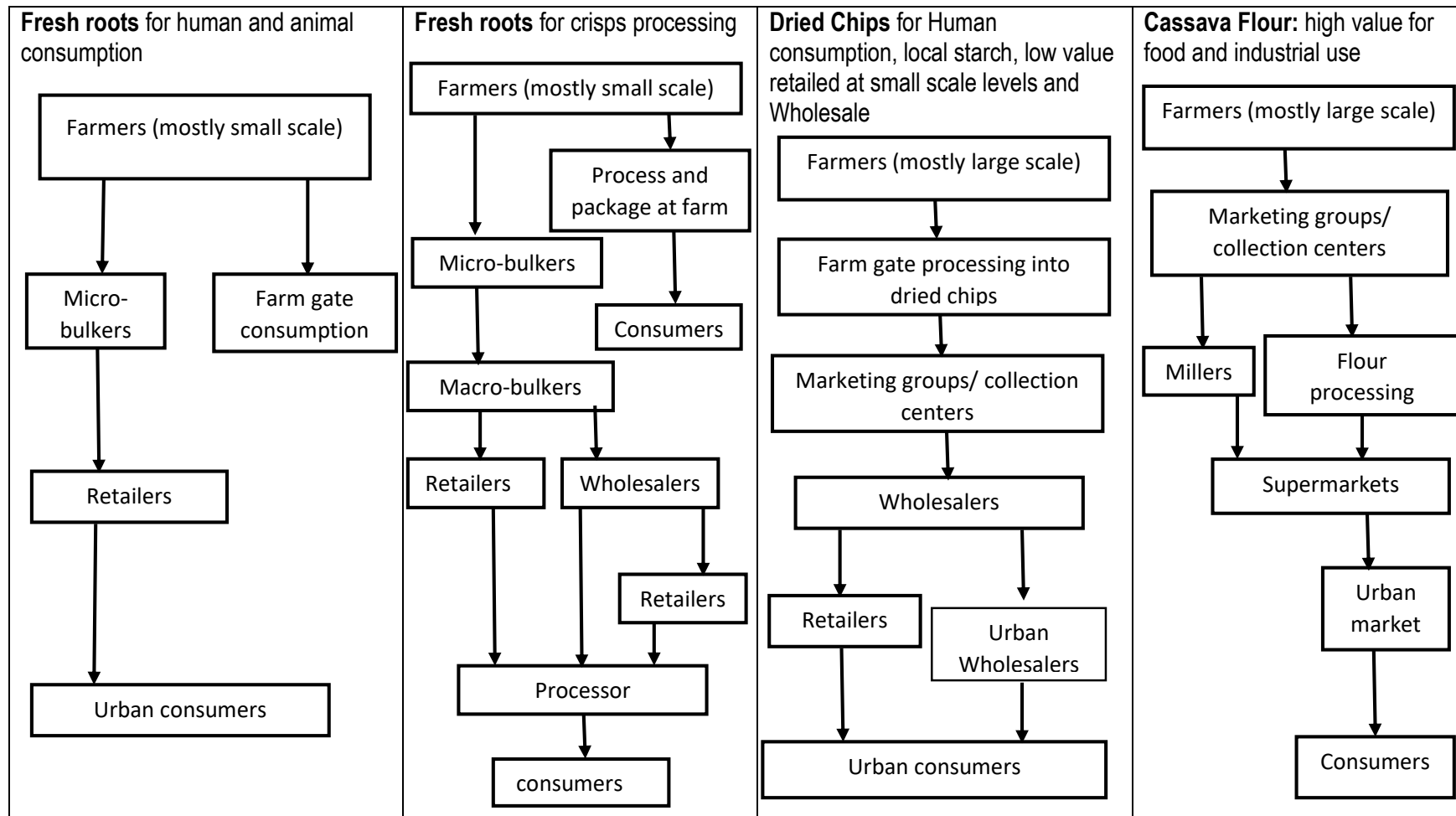
**Marketing chain.** A marketing chain shows different successive markets through which a product pass from the point of production to the final consumer. It is important in describing the relativeness of each exchange point along the entire value chain of a product in the marketing system. According to Bukar *et al.* (2015), marketing chains involve a series of transformation, economic processes and changes in ownership of a given product from the point of production through to the point of consumption. Each commodity has its own unique marketing chain and networks since different intermediaries along the chain perform different functions leading to various transactions. Hence, Thorbeeke (1992), contends that, products gain value through space, storage and transformation while they progress from the point of production to the point of final consumption. According to Thorbeeke (1992), a marketing chain is important in analyzing the relativeness of various markets and exchange points within a marketing system and therefore a long marketing chain reveals that there are many intermediaries within the marketing system. Many intermediaries result to many transactions which results to high costs and therefore a huge difference between prices paid at the point of production and at the point of final consumption. Harieth *et al.* (2010) shows this process where transaction costs and marketing costs contribute to the price of the final product since every actor along the marketing chain wants to maximize their utility.

Marketing channel mapping is a diagrammatic representation of sequential flow of a product from the point of production to the point of final consumption given the activities performed by different actors along the channel. Using data obtained from reviewing different sources including (Milcah *et al.* 2013; George *et al.*, 2016; Florence *et al.* 2017) the Kenyan cassava marketing channels can be mapped as depicted in Figure 3.



**Figure 1. Utility maximization along the marketing value chain**

Source: Harieth *et al.* (2010)



**Figure 3. Perceived cassava marketing channels in Kenya**

Source: Author

## Conclusion

Cassava production is important for food security and its value addition provides varied products for the market. There are many actors along the cassava value chain and each actor aims at maximizing their utility. Moreover, different countries have different ways of processing cassava into various products. Value addition of cassava through processing increases the shelf life of cassava and makes it possible to market cassava across a wide geographical area over time. In Kenya, the cassava industry is unexploited because cassava production is low and there is minimum value addition of cassava products. Over 90% of cassava produced in Kenya is consumed as food and therefore industrial utilization of cassava in Kenya is still very low. Therefore, this review recommends that the government should provide incentives in terms of infrastructure, information, inputs and institutions, to improve cassava production, processing and utilization.

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