

ajfand SCHOLARLY, PEER REVIEWED
AFRICAN JOURNAL OF FOOD, AGRICULTURE,
NUTRITION AND DEVELOPMENT

PUBLISHED BY
Volume 18 No. 1
April 2018

AFRICAN
SCHOLARLY
SCIENCE
COMMUNICATIONS
TRUST

ISSN 1684 5374

Afr. J. Food Agric. Nutr. Dev. 2018 18(1): 13226-13238

DOI: 10.18697/ajfand.81.15955

VALUE CHAIN AND MARKETING MARGINS OF CASSAVA: AN ASSESSMENT OF CASSAVA MARKETING IN NORTHERN UGANDA

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DOI: 10.18697/ajfand.81.15955

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ABSTRACT

Cassava is one of the emerging market oriented agricultural commodities with potential to contribute to improved livelihoods of smallholder farmers in Uganda. Besides being a food crop, cassava is attracting more attention as a commercial commodity. The rise in the commercial orientation of cassava is due to the fact that cassava products have important industrial applications for plywood, textile, bakery, pharmaceutical, paper, alcohol, and food industries. However, this commercial potential of cassava has not been fully realized in Uganda, with cassava being largely produced and consumed domestically. There is need to understand the factors hindering the commercialization of cassava and its products if it's full potential are to be realized. This paper assessed the market potentials of cassava and its products in northern Uganda with the aim of improving its commercialization. Data was collected through a quantitative survey of 110 cassava producers and traders in Lira District between 2012 and 2013. Analysis was done using SPSS and Excel. Results show that fresh tubers dominated the marketed products by both producers and retailers (50 %). Among the three cassava marketing channels, the producer – retailer channel had the highest gross margins; sold as a bag at the farm gate price of \$ 12, the retailer realizes a markup price of \$ 8 per bag. Selling cassava as a “heap” on the street was even more valuable as the price is pegged at an average 50% above the farm gate price. Processing of cassava increased the gross margins by at least 40% compared to fresh tubers. Producers realized gross margins that were 112% above those for fresh tubers, suggesting that producers can benefit from processing cassava into chips. Wholesalers had advantage only when they marketed cassava flour (US\$ 0.32) second to retailers at US\$0.56. These findings suggest that cassava has good market potential to improve the incomes and livelihoods of households in northern Uganda. This, however, can only be realized if cassava can be processed into value added products such as starch and high quality cassava flour which have high commercial values.

Key words: Cassava, cassava products, value chain, marketing margin, northern Uganda



INTRODUCTION

The transition from extreme poverty and hunger requires an understanding of how agricultural markets can work better for the poor farmers [1]. In view of this, the existence of markets is critical to the survival of the farming households [2]. Cassava is an essential staple food crop to over 550 million people in most of tropical Africa where it contributes about 40 percent of food calorie intake [3-5]. It is also an important source of income and as such, plays an important role in rural livelihoods [6]. Besides being a food crop, cassava is attracting more attention as a commercial commodity [7, 8]. This owes to the fact that cassava products such as high quality cassava flour (HQCF) have important industrial applications for plywood, textile and bakery industries, and cassava starch for pharmaceutical, industrial alcohol, processed foods and laundry industries [8, 9]. Consequently, cassava has been identified as one of the emerging market oriented commodities with potentials to improve the livelihood of smallholder farmers in Uganda. This is because the crop is largely grown by smallholder farmers for food and income security. Currently, commercialization of higher-value cassava products is occurring at a small scale [6].

In order for smallholder farmers to benefit from the opportunities offered by cassava marketing, issues of quality and timeliness in supply and price competitiveness have to be identified and addressed [10]. The marketing of cassava still lags behind other cash crops in Uganda. Even though Uganda ranks sixth in cassava production in Africa, producing 4.2 million metric tons in 2010 [9, 11], there is still insufficient supply of adequate quantity and quality to satisfy both domestic and industrial demands from emerging markets [6,9,11].

Given the importance of cassava to livelihoods of smallholder farmers in Uganda, it is important to understand the marketing of cassava and also map the different actors in the value chain [9]. Consequently, there is scope for further research to understand and seek solutions to supply and demand issues that currently bedevil the marketing of cassava [6]. This paper, therefore, contributes to these knowledge gaps by assessing the marketing margins of cassava products in northern Uganda.

METHODS

Study area

The study was conducted in Lira District located in northern Uganda. The choice of the study area was motivated by the fact that northern Uganda is one of the leading producers of cassava in Uganda, with about 34% of cassava production in the country coming from there [8, 9]. Lira, in particular, is the major cassava producing areas by volume; has significant trade in cassava and/or cassava products; and has an attractive market for cassava due to the significant consumption by the local community. However, most of the cassava produced is being used for home consumption and only a little portion is marketed despite the emerging commercial value of the crop. Focusing on northern Uganda for this study would, therefore, highlight the key issues that affect the marketing of cassava and cassava products in Uganda.



Data collection and sampling method

A quantitative survey was conducted between 2012 and 2013 using a pre-tested, structured questionnaire. Primary data were collected from cassava producers, traders and processors. Data were collected on the source, demand, supply and profit margin of cassava and its products, as well as challenges faced by the chain actors in cassava marketing. A combination of stratified, purposive, and simple random sampling techniques was used in this study. The study area was stratified into three sub-counties so as to achieve equal representation from the main cassava producing areas of Barr, Amach and Adekokwok. Ten producers were then randomly sampled from each of the three sub-counties. From the sub-counties, two major markets were purposively selected and ten traders were randomly selected from each of the markets. Lastly, 15 traders and five processors were randomly selected from the urban markets, giving a total of 110 completed questionnaires.

Data Analysis

Data were entered and analyzed in Microsoft excel and SPSS 19.0. The cassava value chain was analyzed by mapping the different value chain actors and categorizing the relationships between them and presented in a value chain map. Marketing margins estimates were calculated through getting the difference between the farm gate price and the cost of production, for the producers, and the marketing margins for the traders were calculated by getting the difference between the selling price and buying price, as summarized in the marketing margin equation, $\pi = TR - TC$.

Where; TR = Total Revenue; given by;

$$TR = \text{Quantity of cassava produce } (q) * \text{selling price}(py)$$

$$TR = qpy$$

TC = total cost of transaction and is given by;

$$TC = \text{Total cost incurred}$$

$$TC = a + b + c + d + e + l$$

Where;

- a = Average cost of packaging
- b = Average cost of storage
- c = Average cost of transport
- d = Average cost of taxes, dues, fees, incurred in the market
- e = Average cost of processing per unit of produce
- l = Labor costs

Marketing margins accruing from the sale of different cassava products were calculated on the weekly average sales of the respective products. The profits were based on the premise that all that the trader buys is always sold. From the marketing margin

equation, $\pi = TR - TC$ where π is marketing margin, TR is the total revenue from the sale of the produce available within a week, and TC is the total cost of transaction.

RESULTS

Characteristics of cassava producers

Data analysis revealed that cassava production was dominated by males (53%), majority of whom were between the ages 15 to 35 years. Production of cassava was mainly done by smallholder producers who cultivated between 0.25 and 1 hectare of land. Over 95% of the cassava produced was consumed within the household. The majority (36%) of the producers had up to five years of experience in cassava production and marketing (Table 1).

Marketed cassava products

Marketed cassava products included fresh tubers, chips and flour, with fresh tubers being the most traded product (Table 2). Trading in fresh cassava was more dynamic and highly streamlined than its processed versions (chips and flour). This could be explained by its short shelf-life which demands swift movement from producers to consumers with minimal delays. In most cases, traders were forced to greatly discount their prices if their cassava tubers reached the market two-to-three days after harvest. The marketable cassava chips were ones that are properly sun-dried to about 12 to 14% moisture content. The reasoning is that well dried chips could be stored for several months in sisal or polythene bags and marketed during periods of high market demand and better prices.

Cassava flour was generally preferred by bakeries, breweries, hotels and households for making staple foods. While most cassava flour consumers usually prefer white, odorless product from well-dried pieces, some preferred yellow-brown flour produced from fermented cassava chips, mainly used for brewing and baking.

Cassava value chain

Trading in cassava took place between producers, village traders, wholesalers and processors. To understand how cassava is marketed, the main marketing channels through which cassava and its products reached the final consumers were traced. The analysis revealed that cassava marketing in northern Uganda takes three differentiated channels that is, producers to consumers, producers via retailers to consumers and producers to wholesalers (Figure 1).



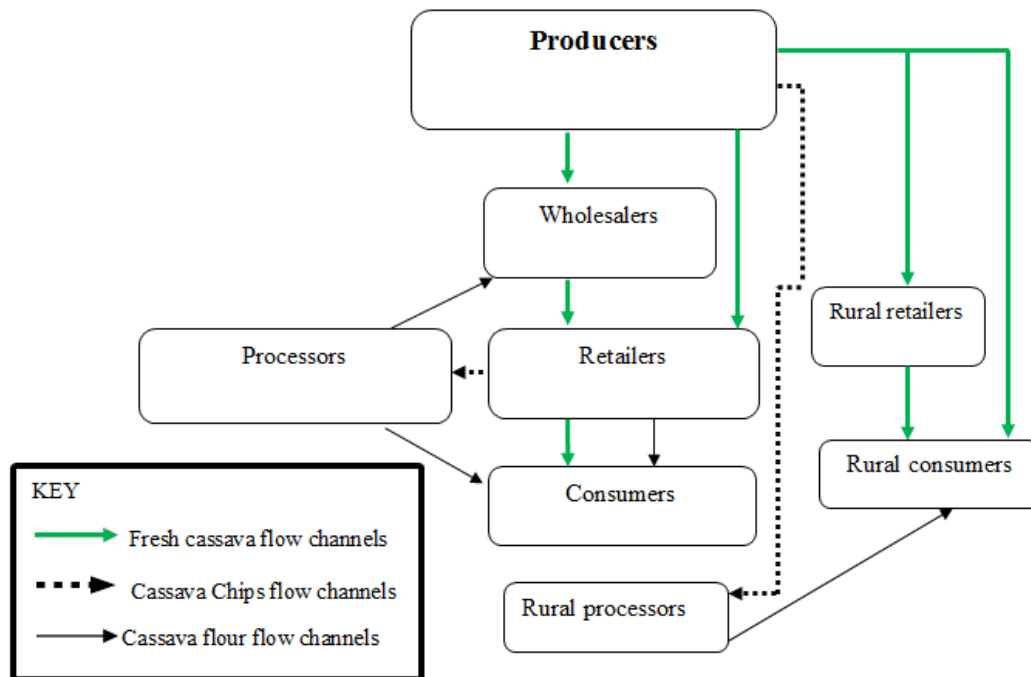


Figure 1: Value chain map of cassava products in Lira District

The channel of producers to consumers was the shortest. Cassava moved through this channel in fresh form (fresh tubers). The producers sell fresh cassava tubers to rural households, mainly in local markets, trading centers and road side markets. The volume of cassava tubers sold by a producer through this channel was on average, one bag (about 120 kilograms) per day. The average retail price received by producers on this channel was Ugx. 500 (USD 0.2) for a pile of cassava tubers commonly referred to as a “heap” which is approximately 2 kg.

In the producer to retailer channel, producers sell cassava tubers to retailers, who in turn retail to their consumers. Retailers in this channel are often situated in the rural areas and move from one market place to another on bicycles or motorcycles. Some retailers sold their cassava products in the urban markets. In this channel, cassava was also marketed mainly as fresh tubers. The retailers bought a bag of cassava from producers at Ugx. 30,000=Ugx (USD 12.00) per bag. A retailer could sell up to four bags of cassava a day at an average price of 50,000Ugx (USD 20) per bag, depending on the season, giving a mark-up of \$8.0 per bag.

The third channel has producers selling to wholesalers, who later sell to retailers, who then sell on to consumers. Here, cassava was marketed in all the three forms that is, fresh tubers, chips and flour. This channel also had cassava millers as service processors. The wholesalers were traders with more financial capacity to buy fresh cassava tubers from producers in bulk and transport them to the urban markets. An individual farmer sold an average of 15 bags of fresh cassava roots through this channel at an average farm gate price of Ugx.30, 000= (USD 12.00); meanwhile the wholesalers sold to retailers at Ugx.50, 000(USD 20.00) per bag

Cassava value chain actors

Producers

Cassava producers were scattered throughout the district. They produced cassava on 0.2 hectare to 2 hectares (mostly in scattered plots) and intercropped with maize and beans. These producers sold to other rural or urban retailers, and/or to wholesalers in fresh form or after processing their fresh tubers into cassava chips or flour. Other farmers also functioned as retailers by selling fresh tubers, chips and flour directly to consumers, mainly households and local restaurants.

Retailers

The retailers carried out activities such as sorting fresh tubers according to sizes, consumer preferences and packaging; while others processed the tubers into cassava chips and flour. The retailers had a fairly large capital base compared to producers and moved to the leading cassava producers collecting fresh tubers and cassava products. After buying two to ten bags of fresh tubers from producers and/or wholesalers at a price range of 20,000 Ugx (8.00 USD) to 35,000 Ugx (14.00 USD), the retailers later sold in heaps (about 2 kg) at 1,000 Ugx (0.40 USD) in the urban or peri-urban markets; a price increase of 50 % above the farm gate price. A section of retailers was found alongside major highways with temporary shelters and store houses where they displayed their cassava products ready for sale to passersby and nearby community dwellers. Besides transporting cassava products from rural areas to town centers, retailers also performed the functions of processing cassava into chips and flour.

Wholesalers

Wholesalers sourced cassava products directly from producers. Most of the wholesalers were dealing in fresh tubers. Other wholesalers even bought unharvested cassava in the fields and engaged the village labor in harvesting, packaging and loading into hired vehicles for onward deliveries to open markets, mainly in Lira town and other neighboring urban markets. There were also wholesalers who contracted producers both for fresh tubers and cassava chips.

Processors

The processors mainly played the role of service millers to the producers, retailers and wholesalers. Processors, therefore, did not own the cassava products that they handled; rather they offered a service for which the business owners paid. Most of the processors, therefore, did not only mill cassava, but a range of products such as maize, millet and sorghum. Milling of cassava was done at 100 Ugx (0.04 USD) per kilogram at the time of the study.

Marketing margin of cassava products

The marketed cassava products included fresh tubers, cassava chips and cassava flour. Marketing margins calculations, therefore, focused on these three products. Marketing margins for the value chain actors accruing from the sales of the different cassava products were calculated basing on the average weekly sales of the respective product. This was done so as to get an understanding of the value that is created through processing of cassava as it moves along the chain. The calculations were based on the



premise that whatever cassava product was brought to market was sold. The marketing margins calculations were based on a kg equivalent of each of the product.

The analysis revealed that retailers obtained the highest margins compared to the producers and wholesalers in the sale of all cassava products. For instance, in the sale of fresh cassava tubers, retailers' margins were 35% more than producers and 57% more than wholesalers. It was also clear that it is more profitable for cassava producers to trade on cassava chips than fresh tubers or flour (Table 3). The marketing margin analysis also showed that it was more profitable to trade in processed products than the fresh tubers. For instance, trading in cassava chips yielded 55%, 27% and 52% higher margins for producers, retailers and wholesalers, respectively. Retailers had the highest margins in all products categories. This result shows that cassava value addition through processing, transportation and storage makes economic sense for all the chain actors.

Marketing challenges

Both producers and traders encountered similar challenges when it comes to marketing their cassava products. The majority (86%) mentioned price fluctuation as the major challenge to marketing their cassava products. Low product quality (79%), lack of market information (46%) and poor infrastructure were also among the challenges faced (Table 4).

DISCUSSION

This study assessed the market potential of cassava and cassava products in northern Uganda. This was done through mapping the value chain of cassava and estimating the marketing margins that accrues from trade in various cassava products at the various nodes along the cassava value chain. The analysis revealed that cassava is marketed in three different forms including cassava flour, chips and fresh tubers, with fresh tubers being the most marketed cassava product. Three reasons could explain this observation: firstly, trade in cassava was mainly to local household consumers who prefer to consume it in fresh form. Secondly, most producers and traders lacked market information on the markets for processed products. This results in a lack of incentives to process cassava into value added products. Third, there is lack of appropriate technologies to process cassava into products such as high quality cassava flour (HQCF). The predominance of fresh tubers trade is driven by the extremely short shelf- life of the fresh tubers and by the price premium that consumers are willing to pay for the freshness [9]. The gross margins analysis was also consistent with this trend, with margins of US\$ 0.32 and 0.21, respectively, for retailers and producers. Cassava chipping was the most common processing done on fresh tubers. Most of the chipping was done at household level where the cassava.

However, due to lack of appropriate technologies for processing, the quality of the processed cassava was poor. The quality gets worse during the wet season due to poor storage and drying facilities. This greatly affects the chips and flour quality, and thus market value of the products. Consequently, use of appropriate processing technologies such as solar dryers and mechanical chippers can help to overcome this challenge and improve the quality of processed products. Additionally, provision of market information



on the market potential of processed products such as the HQCF would go a long way in motivating producers and traders to improve the quality of processed cassava products [9].

It was observed that retailers obtained the highest margins of up to US\$0.32 per bag compared to producers and wholesalers of fresh tubers and cassava flour. On the other hand, producers had the highest profits for cassava chips compared to the retailers and wholesalers. This finding could be explained by the fact that producers carryout cassava chipping at the farmstead, hence avoiding extra costs such as transportation while at the same time taking advantage of the cheap labor available at home. Retailers had higher margins for fresh tubers and cassava flour (US\$ 0.32 and 0.45, respectively) than their value chain counterparts. The reasoning could be that unlike the producers and wholesalers who have to work with pre-determined sales prices, retailers can decide on the prices at which they sell their cassava products. Secondly, because they operate from fixed sales points, retailers do not incur other costs associated with transportation to and from the market. This finding is in agreement with studies by Kilimo Trust which found that retailers had the highest value added in the cassava value chain. This result underpins the market potential of cassava and the potential to improve the livelihoods of rural households [9]. This is because most of the retailing is done by small and medium entrepreneurs, most of whom are start-ups. Being a profitable enterprise, trade in cassava would boost their capital base and help expand their businesses.

Gross margin analysis revealed the cash value added through processing cassava into chips and flour. Trading in cassava chips and flour yielded higher margins (US\$0.25 and 0.08 for a producer, respectively) than trading in fresh tubers. A similar study by Enete showed that marketing margins for processed cassava products was higher in Nigeria [10]. This suggests that the economic value of cassava products in Uganda can be increased through value addition. Even though profitable, only chips and flour were being marketed. Value chain actors were not even aware of products such as HQCF, which have even higher market potential than chips and ordinary flour. Consequently, linking value chain actors to markets for HQCF could further improve their marketing margins. If value chain actors can improve the processing of cassava into value-added products such as HQCF, which has high demand for industrial applications, the value of cassava as a commercial product would increase. This would result in increased income for smallholder cassava producers due to the increased demand for domestic and industrial use of cassava.

Marketing of cassava and cassava products was constrained by inadequate and irregular supply regimes. The seasonality of cassava products results into price fluctuations as well. For instance, the prices of fresh tubers are always low during November to January, which are the main harvesting months and are high from April to June when the supply is low.

Additionally, the quality of cassava flour in the market is poor and does not meet the industrial needs and standards. Quality related problems such as bruised tubers and discolored cassava chips and flour also affect the market value since they are not



preferred by the consumers. A related study by Enete showed that poor quality of cassava products reduces the profit margins obtainable by value chain actors [10].

CONCLUSION

This study assessed the marketing of cassava and its products. The authors analyzed the marketing margins obtained by each actor in the value chain and for different cassava products that they deal in. The results show that marketing of cassava is a profitable venture for all the chain actors. Although trade in all cassava products yielded net positive margins for all actors, it is more profitable to trade in processed products such as chips and flour. With smallholder producers at the center of cassava value chain, improving the marketing of cassava, therefore, has potential for lifting poor households out of poverty. However, to realize this benefit, there is need for value chain actors, especially producers to engage in producing and selling value-added products such as HQCF which have high demand for industrial use.

The findings of this study also have implications for agribusiness managers and development practitioners in Uganda. Managers need to emphasize value-addition to cassava and other commercial crops as a means of harnessing their potential in improving rural livelihoods. This could be done through targeted interventions that will ensure that there was a link between cassava production, production technologies and the end user's demands.

Like any academic research undertaking, this study had some limitations that are worth mentioning. This study was based on cross-sectional assessment of cassava marketing in one district. Secondly, the survey was conducted during the dry season when supply of cassava chips and flour was high. Consequently, there might be variations across regions and seasons in term of marketing and marketing margins. The application of the results of the study to other contexts should be done cautiously. Future studies could test the validity of these results in other regions and value chains.



Table 1: Socio-demographic characteristics of cassava producers

Variable	Percentage
Sex	
Male	53.3
Female	46.7
Age group	
15-35	50
36-55	48
56-75	2
Years of experience in marketing	
1-5	35.6
6-10	32.2
11-15	10.0
16-20	22.2

Table 2: Comparative importance of cassava products traded

Product	Percentage
Fresh cassava	50
Cassava chips	37
Cassava flour	13

Table 3: Marketing margins (Ugx) by value chain actors by product

Chain actor	Marketing margins (UgX)		
	Fresh tubers	Chips	Flour
Producers	526	1,169	737
Retailer	819	1,115	1,397
wholesaler	351	730	802

Calculation based on a kg of product sold

Exchange rate: 1 USD=2500Ugx

Table 4: Challenges faced in marketing cassava products

Challenges faced	%age
Price fluctuation	86
Low quality (flour and chips)	78.6
High costs of transport	32.1
Heavy rains	63
Poor roads	38.6
Lack of storage facilities	21.1
Lack of market information	46.4

REFERENCES

1. **Abele S, Twine E, Ntawuruhunga P, Baguma Y, Kanobe C and A Bua** Development and dissemination of improved cassava varieties in Uganda: Analysis of adoption rates, variety attributes and speed of adoption. *in AAAE Conference Proceedings*. 2007.
2. **Olajide O** Household-food market relations and its implications for food security of farm families in Imo State Nigeria. *African Journal of Food, Agriculture, Nutrition and Development*, 2014;**14(2)**:8709-8724.
3. **Adenle AA, Aworh OC, Akromah R and G Parayil** Developing GM super cassava for improved health and food security: Future challenges in Africa. *Ag Food Sec*, 2012;**1**: 1-15.
4. **Manyong V and B Ayedun** Awareness and adoption of improved cassava varieties and processing technologies in Nigeria. *Journal of Development and Agricultural Economics*, 2014;**6(2)**: 67-75.
5. **Aerni P** Mobilizing science and technology for development: The case of the Cassava Biotechnology Network (CBN). *AgBioForum*, 2006;**9(1)**: 1-14.
6. **Kleih U, Phillips D, Jagwe J and M Kirya** Cassava market and value chain analysis. Uganda Case Study. C: AVA Final Report. *Natural Resources Institute, UK and Africa Innovations Institute, Uganda*, 2012.
7. **Nweke F** A Review of Cassava in Africa with Country Case Studies on Nigeria, Ghana, the United Republic of Tanzania, Uganda and Benin 2. *FAO and IFAD*, 2005.
8. **USAID**. Market assessment and baseline study of staples: country report-Uganda. 2010: Kampala.
9. **Kilimo Trust**. Development of Inclusive Markets in Agriculture and Trade (DIMAT): The Nature and Markets of Cassava Value Chains in Uganda. 2012, *Kilimo Trust*: Kampala.
10. **Enete A** Middlemen and smallholder farmers in cassava marketing in Africa. *Tropicultura*, 2009;**27(1)**: 40-44.
11. **Haggblade S and R Dewina** Staple food prices in Uganda. A paper prepared for the Comesa policy seminar on "Variation in staple food prices: causes, consequence, and policy options," *Maputo, Mozambique*. 2010.
12. **UBOS**. 2014 Statistical Abstract. 2014: Kampala, Uganda.