Banana Value Chains in Central Africa: Constraints and Opportunities

By

Ouma, Emily and Jagwe, John

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Emily Ouma[1*] and John Jagwe[2,3]

[1]International Institute of Tropical Agriculture, Burundi c/o ISABU, B.P. 795 Bujumbura
[2]International Institute of Tropical Agriculture, Uganda, PO Box 7878 Kampala
[3]Department of Agricultural Economics, Extension and Rural Development, University of Pretoria (LEVLO, 002, Pretoria, South Africa)

[*] Corresponding author, Email e.a.ouma@cgiar.org

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Abstract

Smallholder farmers in developing countries need to improve their position in food value chains in order to improve their margins and as a strategy for coping with agricultural food price volatility through innovations within the chains. Value chain mappings and gross margin analysis were employed to assess constraints and opportunities for existing value chains for bananas in Central Africa using market survey data. The results showed weak linkages within the banana value chains with poor integration of value chain actors and minimal involvement with regional markets and high-value domestic chains such as supermarkets. Value addition in terms of agro-processing was carried out at small scale levels using rudimentary techniques limiting the final product to low value markets. Transaction costs comprising transport, handling and storage comprised a high proportion of cost items in the value chain. Generally, the findings suggest that efforts aimed at strengthening linkages within the value chains, collective marketing, penetration into high-value chains and improved processing techniques may provide a potential avenue for enhancing banana value chains in Central Africa.

Keywords: banana value chains, smallholder farmers, Central Africa, collective action

1. Introduction

Volatile agricultural food prices in developing countries have tended to increase the vulnerability of smallholder producers. For producers who are net buyers, soaring food prices imply that a higher share of the household income is devoted to buying food, a similar situation faced by poor urban populations. The additional cost incurred in purchasing food erodes the household financial reserves and production capacities. Net selling households would be in a better position to benefit from the rise in food prices but the impact varies depending on availability of resources to purchase inputs as well as the level of organization of farmers either individually or as a group to undertake value addition and storage until selling is opportune (World Bank, 2008: 14). Generally, smallholder producers lose out with both high and low prices because of poor organization, un-equitable access to markets and lack of safeguard mechanisms to shelter them from market shocks as most have relatively thin coping mechanisms.

Yet, price volatility is expected to increase in the future since the effects of climate change are likely to compound the uncertainty and instability of food production, especially in the tropical regions (ILRI, 2007:10). This calls for efforts to improve smallholder producers' position in the value chains that produce food while also embracing innovative strategies such as forward contracts and warehouse receipting which minimizes risks and uncertainties of agricultural production[2] (Gabre-Madhin, 2009:8). Besides, an integrated approach to value-chain development encompassing agro-processing, storage and market development can be effective in terms of market self-regulation and stability (IFAD, 2009:4). An understanding of the existing value chains is therefore useful to identify new models that would be more efficient, profitable and sustainable while at the same time promoting producer and consumer welfare.

This paper contributes to the literature on agricultural value chains by assessing constraints and opportunities in banana value chains in Central Africa covering Rwanda, Burundi and eastern Democratic Republic of Congo. The banana sub-sector plays an important role in the overall income generation and food security of rural communities in the three Central African countries. The countries are among the 20 leading banana producers in the world with an annual production of 1.5mn metric tonnes and 2.6mn metric tonnes for Burundi and Rwanda, respectively (FAOSTAT, 2008). However, banana trade beyond a local scale be it domestic or foreign, suffers from lack of production efficiency, exacerbated by recent disease outbreaks, and a lack of marketing systems' efficiency and market knowledge (Akankwasa et al., 2008). The three main banana types grown in the region include the cooking type, mainly the East African Highland banana, which is largely produced for home consumption with surplus sold to the market; beer banana cultivars (AB, ABB), which is a main source of household income as it is transformed into banana beer and sold to consumers; and dessert types mainly comprising of AAA and AB types. The rest of the paper is organized as follows; section 2 presents the methodology employed in the study. Section 3 discusses the research findings while section 4 presents the concluding remarks.

[2] Warehouse receipts are documents guaranteeing the existence and availability of a given quantity and quality of a commodity in storage. Such receipts can be used in futures transactions or even serve as collateral for loans.

2. Methodology

The data used in the value chain analysis was based on two main surveys. The first was a banana market survey conducted in 2007 targeting various value chain actors for fresh bananas in Rwanda, Burundi and South Kivu province of eastern Democratic Republic of Congo. A total of 610 value chain actors were interviewed using semi-structured questionnaires. The second was a banana post-harvest transformation survey conducted in 2008 in the same sites in the three countries covering a random sample of 524 value chain actors for transformed banana products (Jagwe et al., 2008;12). Value chain mappings and gross margin analysis were then used to assess the margins along the chains.

3. Results

Sections 3.1 and 3.2 show the results from value chain mappings and margins for cooking and beer banana, respectively.

3.1 Cooking banana value chains

The cooking banana value chain mainly comprise of producers, rural assemblers, wholesalers, rural and urban retailers and consumers as depicted in figure 1. Dessert bananas follow a similar chain.

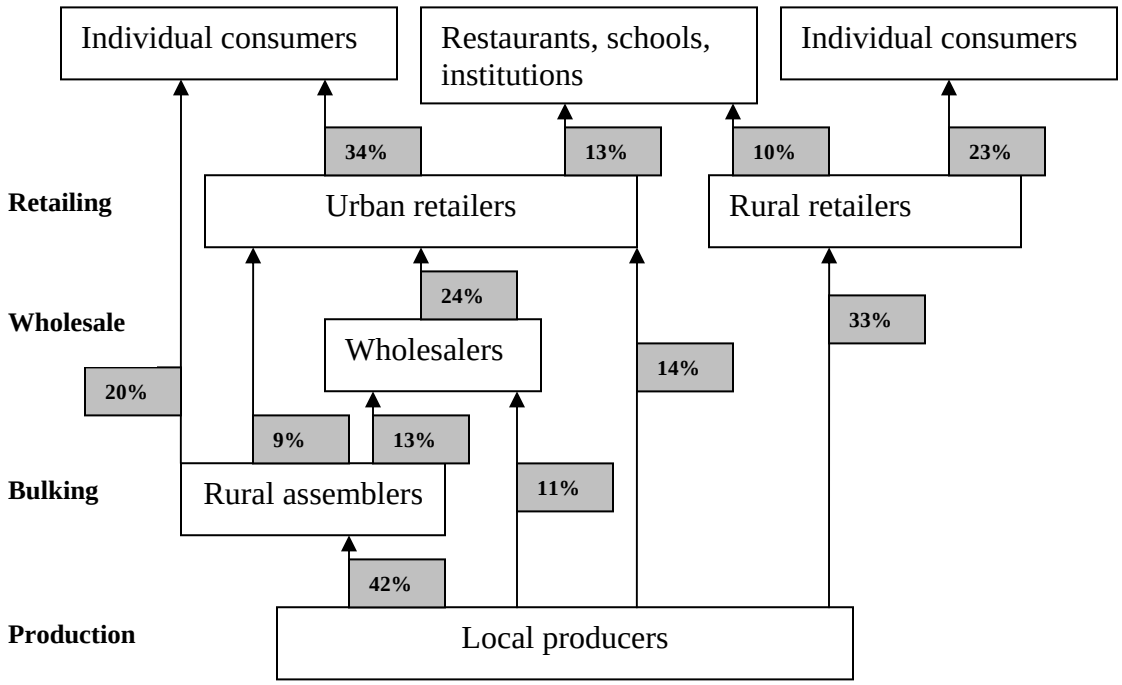

Figure 1 : Cooking banana value chain

The rural assemblers play a crucial role of collecting (buying) and bulking bananas from individual farmers. They handle 42% of total marketed cooking banana production. They bulk the commodity at collection centers which are easily accessed by the wholesalers. The producers are usually disadvantaged in terms of bargaining for higher prices because of the highly perishable nature of bananas, their lack of capacity to process or store the commodity and their low placement in the value chain. The situation is exacerbated by

their lack of information on prices rendering them vulnerable to intermediaries as there is no or minimal information flows along the chain. Sales by producers directly to rural retailers are also common (33%).

This usually occurs in the rural areas whereby producers make their own arrangements to travel to local markets where the retailers are located. Producers involved in such channels earn higher margins per bunch since they tend to move beyond the farm gate and may bargain for better prices though there is a limit to per capita sales to the retailers. The wholesalers are also important actors in the cooking banana value chain, handling 24% of marketed production along the chain. They usually transport the cooking bananas from rural to urban areas and sell to urban retailers who eventually sell to the final consumers. Wholesalers also engage in importation of bananas in the region and may engage in exportation depending on the availability and demand for the commodity within and outside the borders.

There are very few studies that show marketing margins for bananas in general to evaluate the efficiency of the marketing process. The results from the current study show that cooking banana producers get about 20-30% of the final retail price. This however varies depending on seasonality of production. When retail prices are low, the producers' share drops and vice-versa, reflecting the large price variability faced by producers. In Rwanda, Burundi and eastern DRC, the wholesale gross margins per banana bunch has been estimated at US$ 0.4, 0.3 and 0.1 respectively comprising between 7 – 11% of the retail price. The retail margin ranges from US$ 0.2 – 0.4 per bunch accounting for an average of 5 – 7% of the retail price. Mugisha and Ngambeki (1994: 385) found similar margin shares for the Ugandan banana value chain.

3.2 Banana beer value chains

Banana beer processing involves 6 main steps; peeling of bananas, extraction of the juice from the bananas, filtration, dilution, fermentation and packaging. The value chain reflects the predominance of cottage processing of banana beer, which account for 76% of the total marketed banana beer in the survey sites as presented in figure 2. The banana beer cottage industry comprise of traders who carry out banana beer processing using rudimentary techniques. They source beer bananas from wholesalers bulking fresh bananas from farmers. The beer is then packaged in 120Lt. plastic jerrycans for transportation and distribution. The average volume produced is 2,000Lts per month per cottage processor during peak banana production period. Individual farmers also carry out home-based banana beer processing using their own banana production and in some cases even purchase beer bananas from other farmers to meet their shortfall. The cottage brewers mainly sell the banana beer directly at the local market or to bars and restaurants. A small proportion 4%, of the banana beer from the cottage industry is exported to the regional markets. Generally, the cottage industry serves a large proportion of rural compared to urban consumers.

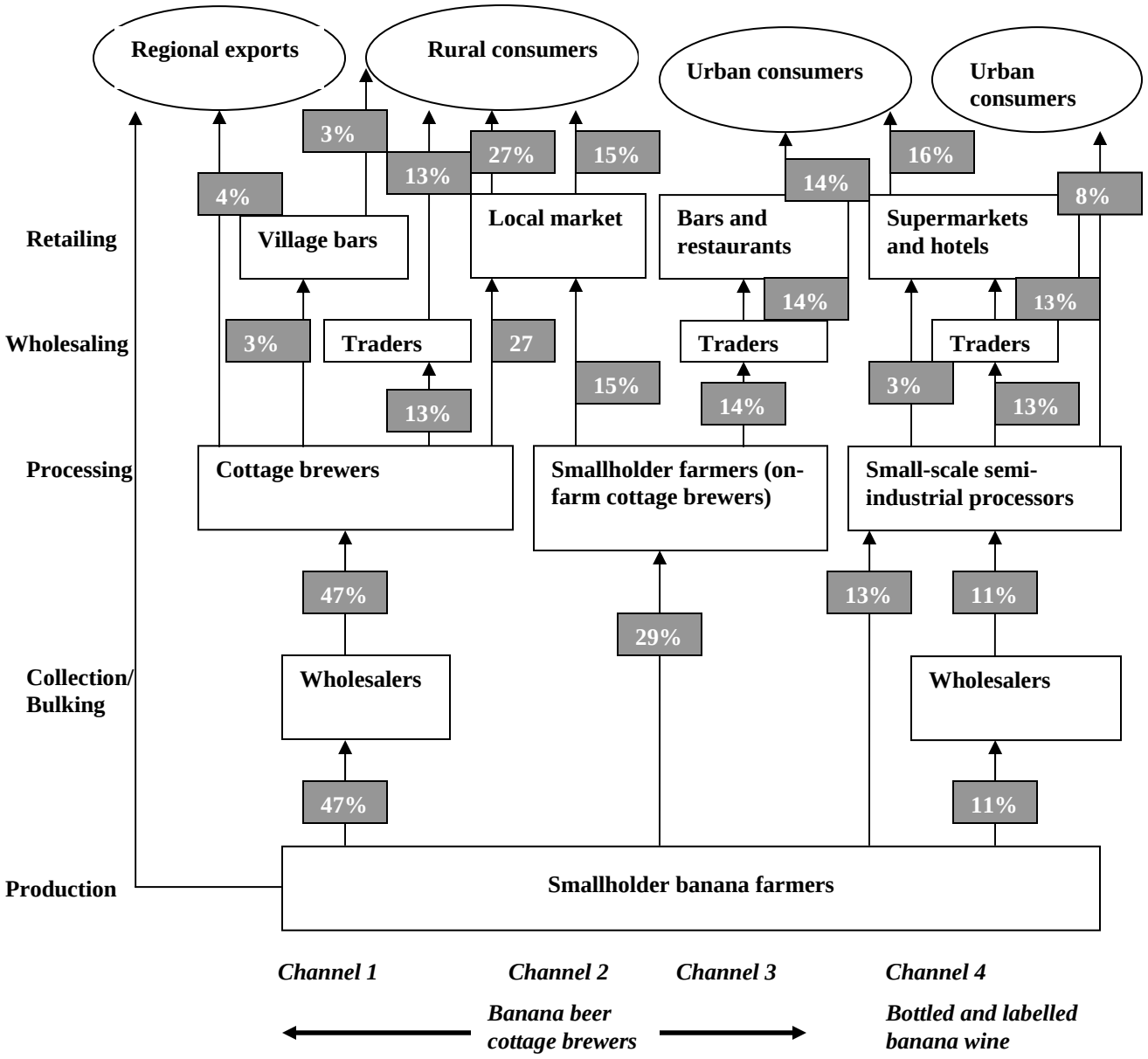

Figure 2: Beer banana value chain

Small scale semi-industrial processors account for about 24% of total marketed banana beer. The processing involves some low levels of machinery use for extraction of banana juice, filtration and bottling. Examples of such processors include Akanovera Company in Burundi, Covibar and Fruits and Crops Initiative in Rwanda. The semi-industrial processors either source beer bananas from individual farmers in local markets, wholesalers or banana juice from smallholder farmers for further processing. The final product is bottled and sales are largely done through wholesalers (16%), who sell to retail outlets such as supermarkets and hotels. The remaining 4% represent direct sales to consumers.

3.2.1 Margins along the banana beer chains

3.2.1.1 Small scale semi-industrial processors

Table 1 shows the costs, revenues and margins for banana beer processing by the small scale semi-industrial processors in Rwanda and Burundi. Generally, the small scale semi-industrial processors are few as reflected by the small sample sizes. In Rwanda and Burundi, the gross margin per banana bunch equivalent is estimated at US$ 1.86 and US$ 2.80 respectively, being 9% and 133% higher than the producer price. The variable costs per bunch are highest in Rwanda with a large share comprising operating costs.

Table 1: Banana beer prices and margins (in US$) for small scale processors

	Country	
	Rwanda (n=11)	**Burundi (n=3)**
Costs		
Producer price for fresh bananas (1 bunch)	1.70	1.20
Banana juice (banana bunch equivalent price)	5.93	
Transport costs	0.88	1.20
Operating costs	1.65	1.55
Casual labour costs	0.56	2.63
Total variable costs per bunch	*10.71*	*6.58*
Revenues		
Revenue equivalent of 1 banana bunch (10Litres)[3]	12.57	9.38
Gross margin per banana bunch equivalent	*1.86*	*2.80*

Figure 3 shows the distribution of the margins of processed banana beer by the semi-industrial processors as a proportion of the retail price. In Rwanda 53% of the banana beer retail price goes to purchase of fresh bananas or banana juice while 26% comprise the margin. The semi-industrial processors purchase banana juice, an already partially transformed product from the cottage processors at a cost of US$ 5.9 per 10 litres (equivalent to processing of 1 banana bunch).

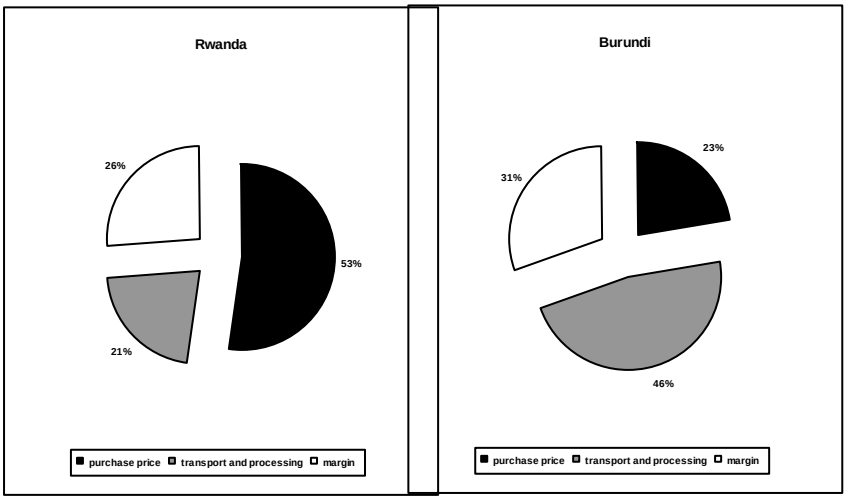

Figure 3: Banana beer value chain margins for small scale semi-industrial processors as a proportion of retail price

[3] Semi-industrial processors do not dilute banana juice with water during processing while the cottage brewers do. 1 large beer banana bunch has been estimated to produce about 10 litres and 16 litres of banana beer for the semi-industrial processors and cottage brewers, respectively.

In Burundi on the other hand, the highest proportion of the retail price, 46% comprise transport and processing costs with the margin estimated at US$ 3.8 accounting for 31%.

3.2.1.2 Cottage brewers

The costs, revenues and margins for banana beer processing by the cottage brewers in Rwanda, Burundi and Sud-Kivu province of the Democratic Republic of Congo is presented in Table 2.

Table 2: Banana beer prices and margins (in US$) for cottage brewers

	Country		
	Rwanda (n = 28)	**Burundi (n = 133)**	**Sud-Kivu (n = 181)**
Costs			
Producer price for fresh bananas (1 bunch)	1.64	0.84	0.87
Transport costs/ operating costs	0.18	0.29	0.33
Casual labour costs	0.74	0.17	0.18
Total variable costs	*1.82*	*1.31*	*1.38*
Revenues			
Revenue equivalent of 1 banana bunch (16Litres)	3.50	2.59	2.11
Gross margin per banana bunch equivalent	*1.68*	*1.28*	*0.73*

The margin per banana bunch equivalent is highest in Rwanda, estimated at US$ 1.68 and lowest for Sud-Kivu, at US$ 0.73. The distribution of the costs and margins as a proportion of the retail price is presented in figure 4.

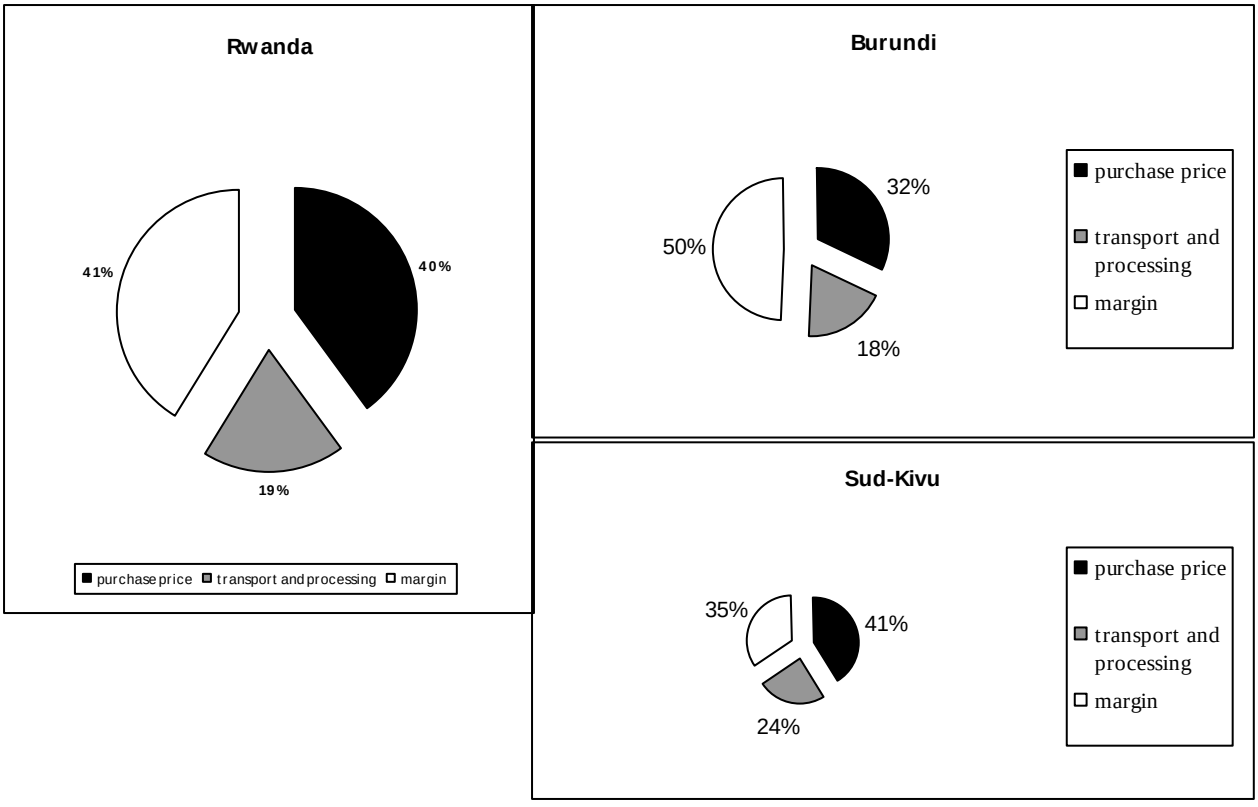

Figure 4: Banana beer value chain margins for cottage brewers as a proportion of retail price

For cottage brewers, the banana beer retail price account for a relatively high proportion of the margins in the three countries. In Rwanda, Burundi and Sud-Kivu, the retail price account for 41%, 50% and 35% of the margins, while transport and processing costs comprise 19%, 18% and 24% respectively. These margins mainly reflect the returns to labour given the low operating costs and almost negligible capital costs incurred by the cottage brewers compared to the semi-industrial processors.

3.2.1.3 Retailers

Table 3 shows the costs, revenue and margins for retailers of banana beer from cottage brewers while figure 5 presents the distribution of the margins as a proportion of the retail price.

Table 3: Banana beer prices and margins (in US$) for retailers

	Country		
	Rwanda (n = 7)	**Burundi (n = 24)**	**Sud-Kivu (n = 12)**
Costs			
Buying price (banana beer 16Lt)	4.00	3.21	2.98
Transport costs	1.06	0.84	1.45
Total variable costs	*5.06*	*4.06*	*4.44*
Revenues			
Revenue equivalent of 1 banana bunch (16Litres)	6.84	5.38	5.53
Gross margin per banana bunch equivalent	*1.78*	*1.32*	*1.09*

The retailers purchase banana beer from the cottage brewers for sale to consumers through several retail outlets. The purchase price is highest in Rwanda at US$ 4 per 16 litres while in Burundi and Sud-Kivu it is approximately US$ 3. The main cost item incurred by the retailers is transportation which is estimated at US$ 1 per 16 litres.

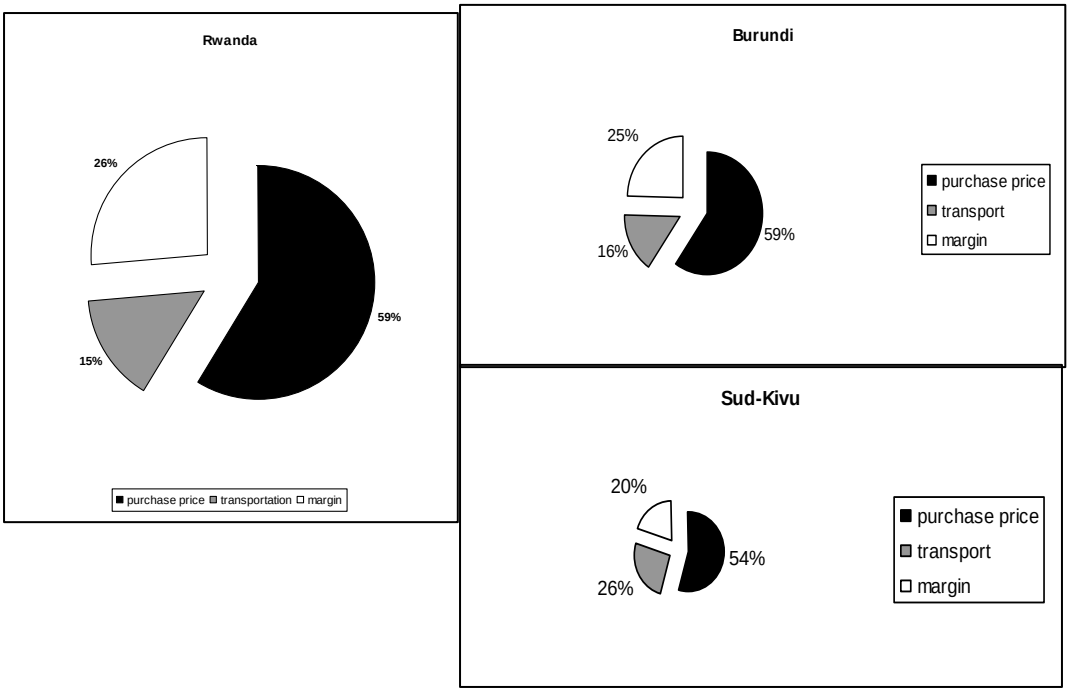

Figure 5: Banana beer value chain margins for retailers as a proportion of the retail price

The retail price comprise between 20% and 26% of the retailer's margins in the three countries as presented in figure 5. The bulk of the retail price accounts for procurement of banana beer from the cottage brewers. Like the cottage brewers, the margins mainly reflect the returns to labour due to the almost negligible capital costs.

3.3 Marketing costs

Marketing costs in Rwanda vary from the rural to urban locations as shown in figure 6 while also reflecting the quality of road infrastructure. In the western province, transport costs comprise 40% of total costs incurred by traders followed by storage (25%) and handling costs[4]. This could mainly be due to the fact that production particularly for cooking bananas is sourced from neighboring high production areas such as the East province. However, in the Eastern province, the storage costs are highest as this is the main production area. In the urban Kigali town, the storage costs are highest followed by handling costs and taxes.

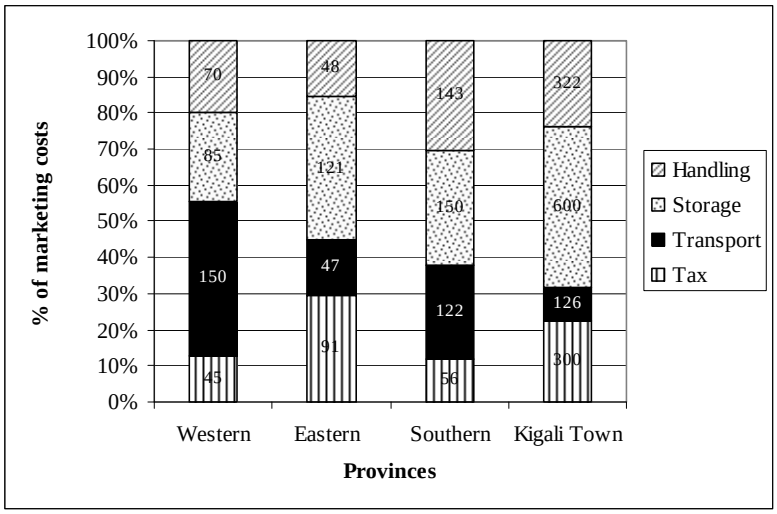

Figure 6 : Marketing costs incurred by traders in Rwanda

Storage and transportation account for the greatest proportion of costs incurred by traders in Burundi during the marketing of banana as shown in figure 7. In Kirundo province, transport costs account for 57% of total marketing costs incurred by the traders while traders in Gitega province incur the highest storage costs. Kirundo represents an area with poor market access. The distance between Kirundo and Bujumbura, which is a large demand centre offering lucrative prices is large and the quality of the connecting road is poor. Although the condition of the road from Gitega to Bujumbura is good, the long distance is one of the main contributors of the high transport costs. Most of the traders in Cibitoke incur high taxation costs, comprising 30% of total costs. The Cibitoke traders particularly those sourcing their bananas from Mugina commune trade in beer banana which is then transformed into wine and then sold mainly in Bujumbura. There are several tax revenue collection points between Cibitoke and Bujumbura. This is not the case for Gitega and Kirundo where some of the produce is actually sold in the local markets.

[4] Handling costs refer to costs incurred for activities such as loading, unloading, bagging, defingering

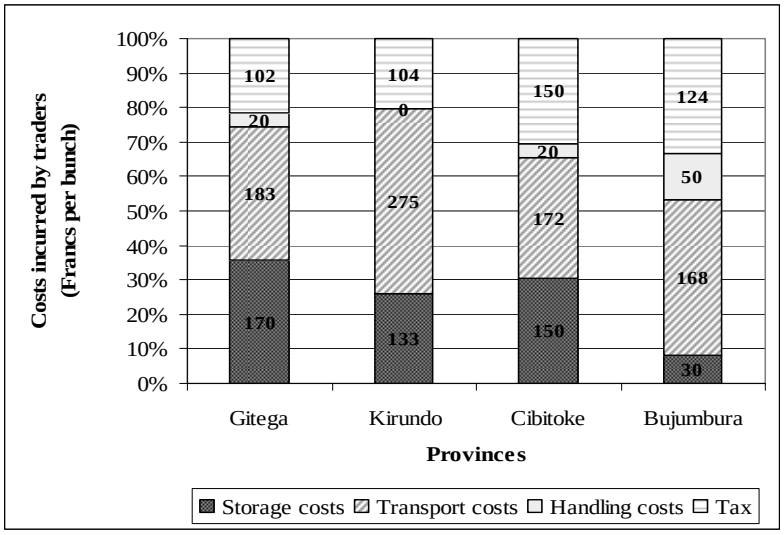

Figure 7 : Marketing costs incurred by traders in Burundi

Figure 8 shows the costs incurred by the different categories of traders engaged in banana marketing in South Kivu province of eastern DRC. The handling costs comprise 50-80% of total costs incurred by all types of traders. The rural assemblers incur high taxation costs consisting 30% of the total costs mainly due to the volume of bananas bulked since taxes are based on volume of marketed produce.

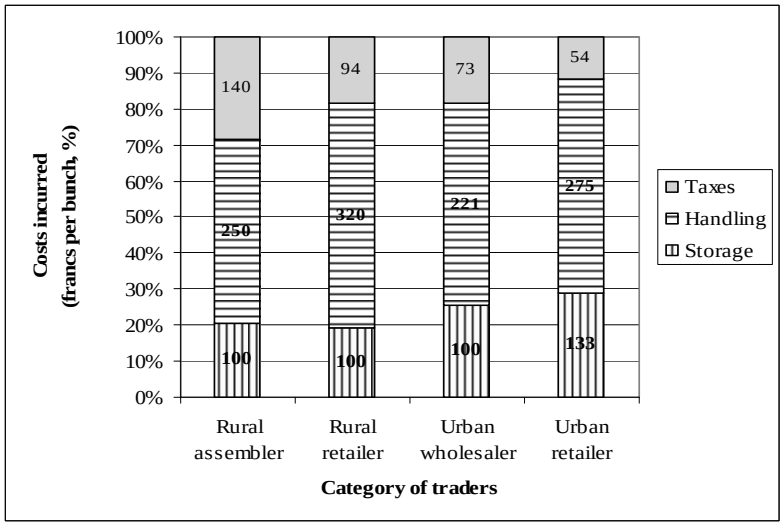

Figure 8: Marketing costs incurred by traders in South-Kivu province of DRC

Most of the marketing costs are transaction costs involved in the value chain. In some cases the transaction costs are so high barring most producers from participating in the value chains (Ouma et al., 2010: 120)

4. Conclusions and Implications

This article has investigated existing banana value chains in Central Africa with an objective of identifying constraints and opportunities of improving smallholder producers' position in the value chains while also identifying strategies that would minimize the effects of agricultural commodity price fluctuations. Results from the banana value chain mappings show absence or minimal involvement in regional markets or high-value domestic chains such as supermarkets. This is completely absent in the cooking banana value chain but present in minimal levels, about 16% of total sales volume of bottled banana beer in the small-scale semi-industrial banana beer processing chain. Participation by the rural population in high value markets has been shown to have high poverty reduction impacts since such chains are associated with lucrative product prices. However such chains are also associated with high quantity and quality standards which can be achieved through collective action by producer organizations. Sensitization of smallholder producers on such value chains through producer organizations, their importance and participation requirements is necessary to improve the producers' positioning and benefits in the value chain as some of the value chain roles such as bulking could be carried out by producer groups thereby improving the margins accruing to producers.

Banana beer processing by cottage brewers was found to be an important contributor to rural income generation in the banana growing areas. This highlights the need to focus on strategies aimed at improving the beer banana value chain. Most of the production of banana beer is done low scale using rudimentary techniques. Promotion of medium to large scale semi-industrial processing through collective action and organized marketing would have potentially high impact on producer welfare. Policies that govern and regulate quality standards for banana beer could further improve its marketing into high value markets and regional markets. Currently, there is no proper government regulation in the three countries in terms of quality standards for banana beer. In addition, the results reveal poor linkages within the value chain as each value chain actor (producer, assembler, wholesaler and retailers) seem un-integrated with other chain players. For instance, the results show no linkages between the semi-industrial banana beer processors and the banana producers as the processors also source beer bananas through spot-markets in local markets. Efforts that promote linkages between the processors with producers through formal or informal futures contracts may go a long way in managing price risks for the benefit of all chain actors.

The results also reveal poor information flow within the value chain making it easy for intermediaries to take advantage of poor rural producers who often lack market information. This is a general problem in most poor countries where formal market information services like radio broadcasts are absent or lack local specificity. This is a clear intervention point for market policies. Efforts that promote forward and backward linkages within the value chains are important in enabling the actors to embrace market dynamism and improve understanding of consumer preferences. In addition, strengthening of linkages with other value chain actors such as input delivery systems, business advisory services and market information systems would improve the efficiency of such chains.

Transaction costs including marketing, handling and other operational costs were shown to be high, comprising a high proportion of the retail prices both for fresh bananas as well as banana beer, a transformed product. These can be reduced through promotion of

collective action through producer groups in order to economize on transaction costs as well as achieving some market power and representation in national policy forums. In some cases producer groups exist but may require some level of empowerment through capacity building efforts.

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