

The role of institutions as actors influencing Uganda's cassava sector

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Abstract

We aim at mapping out a detailed framework that reveals the proportionate flow of cassava and its products along the value chain (VC). Furthermore, we aim at establishing the role of institutions and the linkages between institutions and other VC actors that influence the cassava VC in Uganda. We use both primary and secondary data obtained from four regions in Uganda. Results show that farmers, processors, transporters, traders, consumers and institutions are the major actors. There are four categories of institutions, *viz.* government, non-government, community based organisations and international agencies. Roles performed by institutions include: development and enforcement of policies, Research and Development (R&D), capacity building, and creation of market access linkages for cassava and its products. Findings reveal that there is no clear nexus and no coordination among farmers/producers, processors, traders, transporters and consumers. However, institutions are well coordinated and play various roles along the VC to influence the dynamics of actors. Policy-wise it is important to establish strong private-public partnerships to bridge the impaired linkages between the actors (farmers/producers, processors, traders, transporters, and consumers) and institutions. Strong partnerships are envisaged to reduce the associated transaction costs amongst the actors.

Keywords: farmers, processors, traders, linkages, value chain, institutions, Uganda

1 Introduction

In Africa cassava (*Manihot esculenta* Crantz) is an important source of food and income. According to Adebayo *et al.* (2010), cassava's importance is attributable to its high resilience and adaptability under the many different ecological conditions exhibited in many countries on the continent. Gaffney *et al.* (2012); Kehinde (2006), and Sayre *et al.* (2011) argue further that its ability to be kept for a long period (approximately

2–3 years) in the ground prior to harvesting makes it a reliable food security crop. Besides cassava being consumed as food, it is used as raw material in the production of an assortment of processed products. Balagopalan (2002), Nzigamasabo & Zhou (2006), and Ogwal *et al.* (2012) mention products such as confectionery, animal feeds, and industrial products like paper and starch.

Uganda is Africa's sixth largest producer of cassava (Kilimo Trust, 2012). Farmers have produced between 4.7 and 5.2 million tons of cassava annually over the past five years, and have harvested around 400,000 hectares (FAO, 2014). In Uganda, cassava output is ranked second after bananas and is known to be a crop that

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generates better income and profit than maize (USAID, 2010). Gaffney *et al.* (2012) noted that income from cassava accounted for 6% of the total income generated among cassava-producing homesteads in Uganda in the early 1990s while New Vision (2013) postulated that cassava has the potential of saving the country an estimated \$300m if adopted as a commercial crop.

Given cassava's importance and its potential in alleviating poverty in many African countries, a number of studies assessing various aspects of the commodity have been done. For instance, Adebayo & Sangosina (2005) and Nzigamasabo & Zhou (2006) evaluated cassava-processing innovations and the utilisation of cassava. Other scholars, such as Lemchi *et al.* (2011), assessed the determinants of marketability of cassava products while Adebayo *et al.* (2010) examined how Nigerian smallholder farmers could be sustainably included in high quality cassava flour (HQCF) VCs. Karugia *et al.* (2009) evaluated the VC of cassava flour and other related products.

In Uganda, the existing literature by Collinson *et al.* (2000, 2002, 2003), Kimathi *et al.* (no date), Kilimo Trust (2012), and Kleih *et al.* (2012) indicates that some analysis of the cassava VC has been carried out. These studies reveal that commonly identified challenges encountered along the VC include pests and diseases during the production phase, poor post-harvest handling technologies as well as poor physical infrastructure. Literature also reveals that farmers operate at small scale such that cassava production is below the desired output for industrial purposes and farmers are the most marginalised actors along the chain. Other actors identified include traders (organised at various levels), processors (millers and manufacturers), transporters and marketing agents. Furthermore, it was also noted that linkages between the private sector players and other institutions were very limited. Despite the existence of a number of institutions which influence the cassava VC's dynamics and actors' behaviour, none of these studies examine their role and the nexus between these institutions, and the various actors along the chain. In this paper, we refer to an institution as an organisation, establishment, foundation or society, dedicated to the promotion of a particular cause or program, especially one of a public, educational or charitable character. Furthermore, we have not found in literature any cassava VC study that disentangles the proportionate flow of products in Uganda.

Thus, there exists a knowledge gap regarding the role played by the various institutions and the linkages

between institutions and the various VC actors, as well as a detailed understanding of the proportionate flow of cassava products at the different stages along the chain. It is envisaged that understanding this framework will be crucial in ascertaining how smooth or otherwise the VC operates. This knowledge gap is bridged by mapping a framework that reveals the detailed proportionate flow of cassava products from one actor to another. In addition, this paper aims at presenting the roles of institutions and their linkage with the other VC actors. Attainment of this objective will foster better informed policies, with the aim of ensuring full exploitation of the cassava sector so as to enhance economic development.

2 Methodology

2.1 Sampling and data collection

Based on the country's geographical mapping used by UBOS & MAAIF (2010), this study covered all four regions of Uganda (Central, East, North and West). Primary and secondary data were used for this study. The main sources of secondary data included Civil Society Organisations (CSOs). According to the Organisation for Economic Cooperation and Development (OECD) (2006), CSOs refer to a number of associations that influence how society voluntarily organises itself and which represent a wide range of society's interests and ties. Information regarding institutions (public and private) was gathered from secondary data sources such as the internet and government documents. Government documents used include the National Agricultural Advisory Services (NAADS) implementation guidelines by MAAIF (2010). Primary data were collected from farmers, traders and processors using a semi-structured questionnaire and checklists. In order to validate information provided by the individual respondents, more information was sought from Key Informants (KI), that is, representatives from Non-Government Organisations (NGOs), local council leaders, and community councillors. Furthermore, Focus Group Discussions (FGDs) were conducted within each chosen community.

Five hundred and forty eight respondents (Table 1) under the farmers' category were randomly selected from any two purposefully chosen sub-counties from each district. Comprehensive lists of all households within each of the selected sub-county were accessed through the electoral commission registers. The choice of the sub-counties from each district was guided by a

Table 1: Districts surveyed and the number of respondents interviewed by category

Region	District	Sub-county	Sample category			
			Farmers	Traders	Processors	KIs
Central	Luwero	Kikyusa Kamira	58	6	6	4
	Rakai	Kifamba Kagamba	61	5	6	4
North	Apac	Aduku Apac	61	10	6	5
	Nebbi/ Zombo	Panyango Paidha	51	16	8	4
West	Kasese	Kisinga Nyakiyumbu	41	10	10	2
	Rubirizi	Kichwamba Kyabakara	59	12	8	2
	Masindi	Pakanyi Kigumba	49	25	7	3
East	Serere	Olio Kyere	48	4	3	4
	Budaka	Naboa Lyama	60	10	3	2
	Busia	Busiime Masafu	60	10	6	4
Total			548	108	63	34

KIs = Key Informants

simple criterion based on whether the production of cassava is significant by volume in the sub-county. The main cassava producing sub-counties from each district were selected in collaboration with the district production office. Except for the Central and Northern regions, three districts were chosen from each region, with key emphasis on the major cassava producing districts.

From Central Uganda, only two districts were selected given that during the second season of 2008 and the first season of 2009, the region exhibited less than 50% distribution of pure stands of cassava plots as compared to the Western, Northern and Eastern regions which registered 57.2%, 59.7% and 70.2% of pure cassava plot stands, respectively (UBOS & MAAIF, 2010). Despite the fact that the Northern region registered a high proportion of pure cassava stands (59.7%), two districts were chosen because it exhibited the least percentage distribution of households that produced cassava in both the second season and first season of 2008 and 2009, re-

spectively. According to UBOS & MAAIF (2010), 18% (2nd season of 2008) and 14.3% (1st season of 2009) of the households in the Northern region engaged in cassava production relative to an average of 25.4%, 33.1% and 25.4% for the Central, Eastern and Western region respectively for the two seasons.

Traders and processors were also randomly selected from the purposefully chosen sub-counties and municipalities/town councils using comprehensive lists of all registered traders and processors obtained from the head offices of the traders' associations. By use of a checklist, two FGDs per district were held with members from the various categories of VC actors, leading to a total of 20 FGDs. Key informants were selected from either the respective district production offices, the NGOs/CBOs or the government institutions that were influential in the cassava VC. Table 1 shows that the study was based on 773 respondents (n=773), with farmers having the largest proportion (70.9%).

2.2 Data analysis

Spreadsheets were used to clean and edit the data from any outliers and entry errors. STATA version 9 was then used for the detailed data analysis. Following Kilimo Trust (2012) and FAO (2005), this study used a VC approach based on the functional analysis to identify all actors that influence the VC, as well as the nexus between institutions and other VC actors. Within the functional analysis domain, the different actors and their roles in the VC were identified. That is, *i*) physical flows of cassava and its related products were identified, *ii*) the various actors as well as institutions and their roles at each stage were also identified, and *iii*) the linkages between the producers/farmers, processors, traders and institutions were mapped.

Notably, VC mapping entails generating visual illustration between actors in the VC as well as other market players. It enables to illustrate and understand the process(es) that a commodity goes through from the farm gate until it reaches the final consumer. Furthermore, a VC map is also useful for recognizing and categorizing key market actors and support organisations as well as revealing the various market channels a product takes before reaching the final consumer. Information generated from focus group discussions and interviews with key informants was analysed using descriptive statistics and used to validate the information about institutions obtained from the individual respondents. Secondary data especially in form of existing literature was reviewed to better understand the initiatives carried out in the cassava sector in Uganda.

3 Results

3.1 Proportionate use of cassava and its products

About 95 % of farmers' cassava output is made up of fresh cassava roots and the remaining 5 % by fresh leaves (Figure 1). Fresh cassava leaves are rarely commercialised, given that almost 100 % of the leaves are consumed at household level. About 70 % of cassava leaves are used for human consumption as vegetables by households while 30 % are used as animal feed supplement usually fed to pigs without any form of value addition. Out of the total output, a large proportion (40 %) of cassava roots is consumed in fresh form. The roots may be roasted, steamed or mashed. Of fresh cassava roots consumed, the proportion that is directly sold by farmers greatly differs between small scale, medium and large scale farmer categories. Small scale farmers directly commercialise less than 10 %, while medium and large scale farmers directly sell 20–40 % and more than

60 %, respectively. About 9 % of the fresh cassava is exported to regional markets, including southern Sudan, Tanzania, Kenya, D.R. Congo, Rwanda and Burundi. The remaining proportion (51 %) of fresh roots is processed into an assortment of products with cassava chips being the most important (31 %), followed by local gin (11 %), flour (5 %), starch (2 %) and gari (2 %).

It was noted that much of the cassava chips (46 %) are processed into flour. Figure 1 shows that cassava flour and chips are sent to the largest number of destinations – six in the case of flour and five in the case of chips. About 63 % of the flour is used for household human consumption, a small proportion of which is sold through supermarkets. Furthermore, 34 % of the flour is exported to neighbouring countries while the lowest proportion (0.1 %) is used in the paper manufacturing industry. Cassava flour is also used for brewing, baking and confectionary. With regard to chips, the largest proportion (51 %) is exported to the regional markets. More than 90 % of the local gin is for human consumption and the remaining ends up in schools, for laboratory use. All gari is consumed at household level, while starch is only used in schools for laboratory experiments and by the food industry.

3.2 Key actors

Analytical results (Figure 2) show that the cassava VC consists of five key actors: farmers/producers, traders, processors, consumers and institutions. Farmers were mainly responsible for cassava production, with 85 % being small scale farmers while the others were either medium (5 %) or large (10 %) scale farmers. Small scale farmers produce cassava on less than one hectare of cultivated area, medium scale farmers use between 2–10 hectares while large scale farmers grow cassava on more than 10 hectares. Processors comprise of individuals and business entities that transform fresh cassava into other products, mainly chips, chops, slices, grits, gari, flour, starch or snacks. Processors are basically categorised as primary, intermediary or tertiary. Primary processors, mainly women, use basic tools like pangas, chippers, and graters to convert small quantities of fresh cassava into chips, chops, slices and grits.

Intermediary processors, mainly men, are responsible for bulking intermediate cassava products (granules, chips, chops and slices), milling them into flour and then selling it to wholesale traders. Such processors often have motorised hammer mills and are organised in well-coordinated groups comprising a manageable number of people. Tertiary processors are characterised by turning intermediary products into products such as

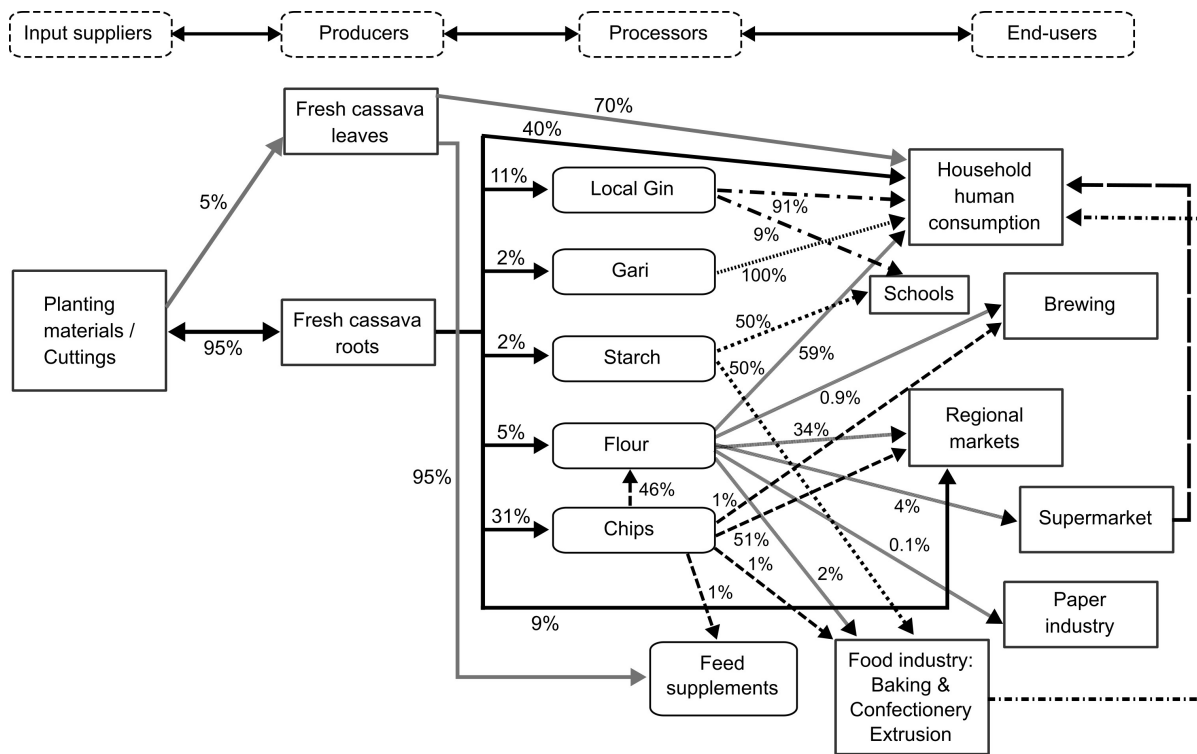
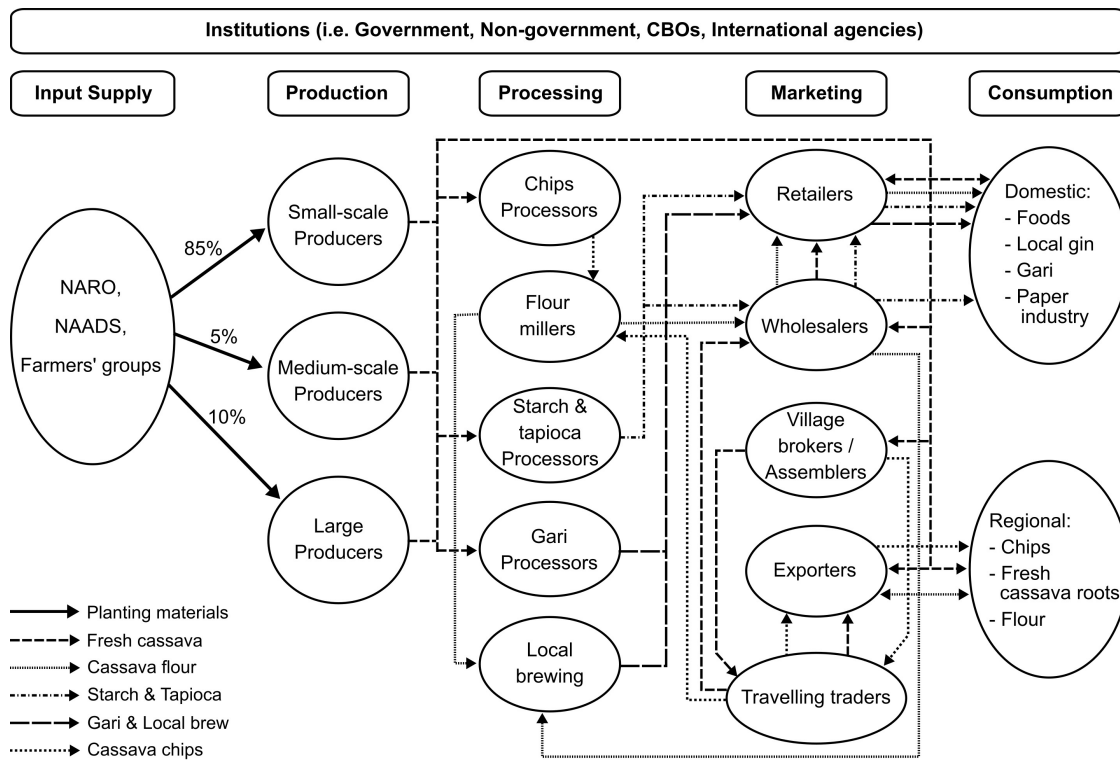


Fig. 1: The use of cassava and its products in Uganda



CBOs: Community Based Organisations; NAADS: National Agricultural Advisory Services; NARO: National Agricultural Research Organisation

Fig. 2: Interaction of actors along the cassava value chain in Uganda

local gin, as well as other flour based products (like porridge, bread and pancakes).

Traders consist of retailers, village assemblers/brokers, transporters/travelling traders, wholesalers, and exporters (Figure 2). Retailers operate in local open markets and small shops. Village assemblers/brokers in collaboration with transporters/travelling traders obtain cassava products from villages and deliver it to markets. Travelling traders move from place to place with lorries or pick-up trucks procuring fresh cassava and cassava slices/grits/chops/chips from producers. The traders then transport the fresh and the related intermediate products to markets where they either sell directly to millers (in the case of dry slices/grits/chops/chips) or to wholesalers in the case of fresh cassava roots. In some instances the travelling traders use agents to negotiate with producers, collect the produce as well as dry cassava products on their behalf.

Often wholesale traders also assume the role of processors given that they can afford to build and run stores/warehouses to act as bulking points of sale. They deal with large volumes of cassava chips and flour. Brokers are responsible for bulking cassava chips at designated stores/warehouses at the discretion of appointing wholesalers or travelling traders in the various parts of the country. They work as commission agents and are paid based on the amounts of chips collected. There are no contractual agreements between traders and these agents which sometimes lead to loss of capital by traders, especially when traders pay brokers upfront. Cassava end-users can be grouped into two categories, namely intermediate and final consumers. Intermediate

consumers are those who purchase cassava products and then turn them into products of higher value, such as starch and beer, while final consumers purchase cassava products and prepare them in various forms for household consumption.

A number of institutions are also involved in the cassava VC. However, unlike the other VC actors that are directly involved in the cassava VC, institutions play a supporting/ facilitating role at various stages of the VC. Some institutions perform roles that influence more than one actor along the VC. Four institutions can be categorised: government bodies, non-government agencies, Community Based Organisations (CBOs) and international agencies. With respect to the roles played by institutions, the results (Figure 3) show that government institutions are mainly responsible for the development and enforcement of policies, while non-government agencies and CBOs mainly focus on capacity building. In this context, capacity building refers to a process of developing and strengthening the skills, instincts, abilities, processes and resources of the VC actors so as to enhance the development of the cassava sector.

International agencies are more concerned with Research and Development (R&D), followed by capacity building. A large contrast however exists between government institutions and the other categories of institutions (Figure 3) with respect to the development and enforcement of policies. Results also show that some respondents were not sure of the roles played by institutions across all the four categories. Furthermore, results reveal that the various categories of institutions are equally responsible for providing technical support to the value chain actors. With the exception of govern-

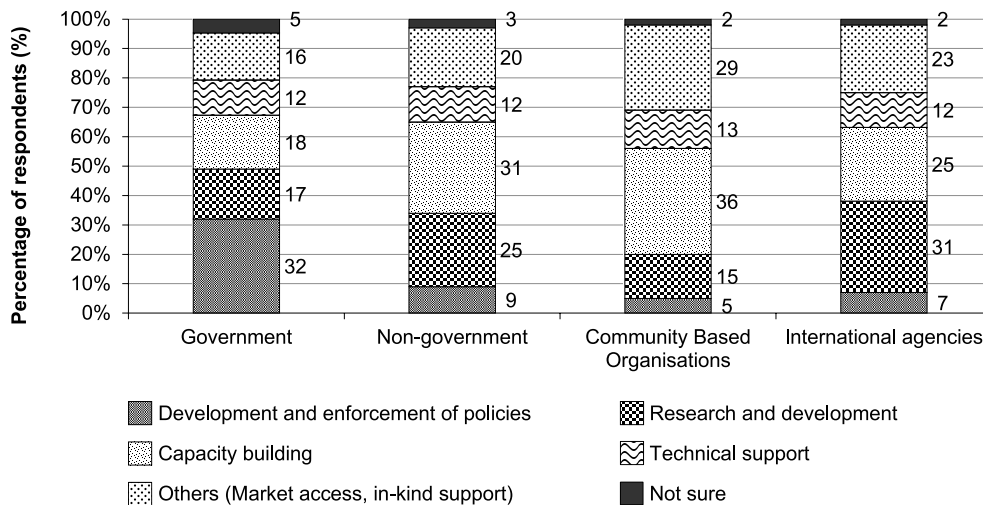


Fig. 3: Cassava farmers’ assessment of the roles played by the various categories of institutions

ment institutions, other categories of institutions seem to equally play other roles like enhancing market access and providing in-kind support.

As a means of validating information availed by the individual farmers, data sought from Focus Group Discussions (FGDs) and Key Informants (KIs) was also analysed. Results of that analysis concur with the individual farmers' findings, except for the non-government agencies for which 9% of the key informants acknowledged that they take part in the development and enforcement of policies yet findings based on FGDs suggest otherwise.

3.3 Linkages amongst key actors in the cassava value chain

Markets are a result of many different actors interacting to enable the exchange of goods and services. Assessment of the vertical and horizontal linkages amongst the actors reveals that formal vertical linkages based on contracts are almost non-existent yet they enhance the movement of products to end markets. Although such linkages come with a transaction cost, they enhance trust among the various actors along the VC and enhance effective planning as well as efficiency along the chain. Furthermore, formal horizontal linkages amongst these actors are either minimal or non-existent, thus leading to high transaction costs and low economies of scale. This finding relates to results by Kilimo Trust (2012).

Detailed analysis shows that over 95% of the actors (producers/farmers, traders and processors) along the VC have no formal agreements with their customers, and about 99% of the traders have no specific markets for their cassava products. Only about 5% of the actors secure formal contracts with customers and these are mainly institutions. The middlemen dominate the category of traders as actors and are indispensable in bridging the gap between the farmers, processors as well as the consumers. They buy cassava and its related products and resale it or make it available to consumers. However, they are noted to deter the development of strong horizontal and vertical linkages among the various actors due to their shrewd behaviour.

In contemporary market chains, institutions create policies which influence and shape other actors in taking particular actions which in turn influence or change VC. Institutions are linked to the other actors along the VC through the provision of a conducive environment. In this context, a conducive environment refers to the services, that is, the policies or standards, in-kind support, R&D and technical support which institutions render to the other actors. Unlike the linkages between

other actors that directly influence the activities along the value chain, the linkages between the various institutions and the VC actors are formal, based on contractual agreements. This formal relationship may be associated with the fact that institutions tend to operate in an organised manner and have the capacity to mobilise farmers into clusters that can reliably supply good quality cassava and its related products in large quantities. For instance, Nakasongola- and Masindi- District Farmers' Associations (DFAs) established formal contractual agreements with firms like Triad links/Tullow Oils to supply cassava products. Formal linkages tend to lower transaction costs and increase trust amongst the other actors. Conversely, non-functional or poor institutions increase transaction costs amongst the VC actors.

4 Discussion

Based on the results, more than 50% of fresh cassava roots are processed into other products given that it is highly perishable after being harvested (Naziri *et al.*, 2014). Thus, in order to minimise post-harvest losses, cassava has to either be consumed or processed within a few days. The high importance of cassava chips may be attributable to its potential to substitute maize bran in animal feed rations while if processed into HQCF, it can replace wheat flour in the confectionery industry. This concurs with earlier work by Graffham *et al.* (2000). The low proportion of fresh cassava devoted to starch and gari production may be associated with the high costs incurred in starch extraction and the relatively small niche market which for gari in Uganda, respectively. Graffham *et al.* (2000) urged that Uganda's market size for starch is too small for the investors to be able to recover investment costs. With reference to VC actors, the high proportion of small scale farmers relative to the other categories may be attributable to the high level of land fragmentation in Uganda.

In terms of roles played by institutions, the high proportion of respondents (32%) arguing that government institutions are responsible for policies may be attributable to the fact that government institutions, particularly MAAIF and UNBS are at the forefront of developing and enforcing agriculture related policies in the country. This argument concurs with views of USAID & EAT (2013). The relatively low proportion of government institutions' participation in providing other services (16%) may be due to the small proportion of funds allocated to the agriculture sector in the national budget. Rwakakamba (2013) argues that the agriculture sector has never received more than 5% share of the national budget since the 2009/10 financial year. Agriculture is

the lowest ranked sector in the economy and the allocation is below the Maputo Comprehensive Africa Agriculture Development Program (CAADP) target of at least 10 % (Rwakakamba, 2013).

The importance accorded to capacity building by both NGOs and CBOs may be attributed to the fact that donor agencies such as USAID, and International Development Research Centre (IDRC) tend to contract CBOs and non-government agencies that focus on helping smallholder farmers to overcome bottlenecks encountered along specific VCs. Arguably, CBOs and NGOs understand community dynamics at grass root level. Ulleberg (2010) opines that such institutions are innovative and adapt more quickly than government institutions.

The relatively high proportion of respondents acknowledging the participation of international agencies in R&D may be associated with the eminent work done by bodies like the International Institute of Tropical Agriculture (IITA) and Natural Research Institute (NRI). The high focus of international agencies on capacity building as well as R&D may be attributable to Uganda's need to establish sustainable systems among the various actors along the cassava sector. Thus, the various institutional categories seem to be working within the country's strategic plan of enhancing productivity and efficiency along various commodity VCs.

The peculiar results (Figure 3) that respondents are not sure of how institutions take part in the cassava value chain may be a result of the many people especially in rural areas who can not easily distinguish between the various categories of institutions, mainly due to the overlapping nature of work being done in the cassava sector by institutions. Moreover, government and international donor agencies tend to use CBOs and locally established NGOs to engage the local populace. Generally, the close proportion of responses across the various institutional categories (i.e. government (35 %), NGOs (35 %), and international agencies (30–34 %)) with respect to the provision of R&D services may be associated with the fact that after the cassava mosaic virus outbreak, government bodies like MAAIF and international agencies like IITA strongly sensitized people about the disease.

With regards to the vertical and horizontal linkages amongst the actors, the marginal existence of formal vertical and horizontal linkages based on contracts may be attributable to the informal nature of trade in cassava and its products. The mal-functionality of such linkages thus influences the inefficiency and poor competitiveness of the cassava sector. The small proportion of

actors with formal contracts may be explained by the fact that few institutions are able to consistently supply large consignments of good quality cassava products.

The roles played by the various institutional categories are exemplified and discussed in detail below.

Key government bodies identified by farmers include the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), National Agricultural Advisory Services (NAADS), the Uganda National Bureau of Standards (UNBS), National Agricultural Research Organization (NARO) and Local Governments. These bodies play various roles which may in some instances be cross cutting.

In Uganda for instance, MAAIF together with UNBS were at the forefront of setting and monitoring of cassava related policies and by the end of 2006, six product quality standards were drafted (Ntawuruhunga & Okidi, 2010). UNBS also builds the technical capacity of other actors along the VC, especially the processors through trainings. NARO engages in R&D through the multiplication of improved varieties like NASE 1, NASE 2, NASE 3, NASE 4, NASE 10, and NASE 12 that are resistant to Cassava Brown Streak Disease (CBSD) and Cassava Mosaic Virus (CMV). NAADS supplies farmers with improved cassava planting materials (cuttings) free of charge through the Village Farmer Forum (VFF).

Non-government agencies identified include: Uganda National Farmers' Federation (UNFFE), Sasakawa Global 2000 (SG2000), the Dutch Agricultural Development and Trading Company (DADTCO) and Agency for Accelerated Rural Development (AFARD). For instance, SG2000 organised farmers into clusters, forming a One Stop Center Associations (OSCA), through which farmers get access to inputs, training, and processing equipment while UNFFE works closely with the departments of agriculture in local government and District Farmers Associations to train farmers in various agronomic practices and value addition. DADTCO introduced an autonomous mobile processing unit (AMPU) to overcome the constraint of high perishability of fresh cassava roots.

Community Based Organisations (CBOs) include District Farmers' Associations (DFAs), Pioneer Action for Sustainable Development and Serere Orange-fleshed Sweet potato Producers' Association (SOSPA). The CBOs process cassava into various products and sold locally in the neighbouring districts and markets. International agencies such as the International Institute of Tropical Agriculture (IITA), Natural Research Institute (NRI), African Agricultural Technology Foundation (AATF), Catholic Relief Services (CRS) and the

Private Sector Foundation (PSF) play different roles ranging across training, input supply, financial support and creation of market linkages. For example, IITA in collaboration with Ugachick Poultry Breeders Limited screened yellow genotypes that could resist cassava mosaic disease and cassava brown streak disease (Ntawurhunga & Okidi, 2010).

In partnership with the National Crop Resources Research Institute (NaCRRRI), AATF facilitates access to the machinery and other agro-inputs like fertilisers and herbicides in Apac and Nwoya districts. Currently, NRI in collaboration with national partners is implementing the "Cassava Adding Value for Africa (C:AVA)" project with the aim of developing the VC of High Quality Cassava Flour (HQCF). International institutions like USAID also provide financial support to facilitate activities within the cassava sector. Private sector agencies like the Private Sector Foundation Uganda (PSFU) are mainly interested in providing investment services, value addition, business development services and enhancing market linkages.

5 Conclusion and policy implications

Uganda's evolving cassava VC is largely a supply push rather than a demand driven chain. Among the farmers/producers, processors, traders, transporters and consumers, hardly any cooperation exists, resulting in mistrust, information asymmetry and individualism in the cassava trade. Institutions however, play a very critical role to ensure that the other VC actors (farmers, processors, traders, transporters, consumers) are well aligned so as to enhance both horizontal and vertical linkages. Government institutions are mainly at the forefront of the development and enforcement of policies as well as R&D, among other roles played. Other categories of institutions play cross cutting roles like capacity building, establishing market linkages, and R&D. Due to its numerous uses cassava presents a high potential for transforming rural livelihoods in Uganda through job creation and food security.

Policy-wise, it is prudent to design complementary interventions that ensure strong linkages and coordination amongst all actors. For instance, farmers should sell cassava to traders directly from the field. Well-coordinated VC actors will ensure smooth flow, cost-effective and timely delivery of raw materials to processors and products to end markets. Better logistic operations will improved trust among chain actors and will reduce post-harvest losses. Institutions in charge of trade policies, like UNBS, should work together with

the various actors to develop and popularise cassava standards. These are very crucial within the sector given that high quality cassava products can easily be sold within the East African regional market and at a higher price. Stronger linkages and coordination will stimulate synergies, hence value and good performance along the chain. In the long run, this may lead to a demand-driven rather than a supply-driven VC, where producers and processors produce in anticipation of markets.

There is need to establish a culture of nurturing business ideas at the various levels along the chain into commercially viable and profitable ventures. This could be achieved through the expansion of the bio-business incubation and entrepreneurship centre. Similarly, the country could encourage and support establishment of Small and Medium Enterprises (SMEs) so as to improve the cassava VC. This approach will encourage youths in participating in cassava-related business. The SME approach may be implemented through imparting skills to the youth and helping them to establish cassava-based businesses such as the production of cassava chips, starch, and bio-ethanol. It is also important that Uganda establishes a website through which the various actors can easily access useful information (such as market prices and tonnage produced) in order to reduce the information gap among the actors.

It is also strongly recommended that farmers are put in the conditions to profitably produce more cassava so as to ensure consistent supply of fresh root to the other VC actors. Increased cassava production may be achieved through clustering of small scale producers into small groups, as this is bound to increase the productivity because groups find it easier to mobilise the required manual labour and to access agro-inputs. This implies that small scale farmers will be in position to sufficiently supply materials for industrial purposes. All that said, increased cassava production will inherently require a reliable supply of high-yielding planting, disease-resistant varieties, mechanisation of the farming practices and adequate technical expertise at the various stages along the chain. Thus, it is important to establish strong private-public partnerships in order to tackle all the above mentioned aspects and enable the development of the cassava sector in Uganda.

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