

Value Chain Analysis of Cassava in Wolaita Zone, Snnpr, Ethiopia

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Abstract

Value chain analysis of Cassava in wolaita zone was conducted with the objective of identifying cassava value chain actors and their functions, developing value chain map of cassava in the study area and identifying the value chain upgrading and market development strategies. A survey was carried out on six randomly selected kebele administrations of Wolaita zone from potentially producing districts (Gassuba and Kindo Koysa Woreda). Both primary and secondary sources of data were used to conduct the study. Primary data for were collected from 122 farmers, 48 traders and 23 consumers through application of appropriate sampling procedures and secondary data were obtained from written documents. Data were collected by using both close ended and open ended questionnaire through personal interview, group discussion, and key informant interview. Descriptive statistics were used to analyze the data. The Value chain analysis indicated that the value chain functions in the survey period were input supply, production, marketing and consumption, the major actors in the value chain are input suppliers, cassava producers, collectors, wholesalers, retailers, processors and consumers.

Keywords: Value addition, Value chain, value chain map and actors

INTRODUCTION

Cassava is a perennial woody shrub with an edible root, which grows in tropical and subtropical areas of the world. Cassava originated from tropical America and was first introduced into Africa in the Congo basin by the Portuguese around 1558. Today, it is a dietary staple in much of tropical Africa. It is rich in carbohydrates, calcium, vitamins B and C, and essential minerals. However, nutrient composition differs according to variety and age of the harvested crop, and soil conditions, climate, and other environmental factors during cultivation (Allem, 2002).

Ethiopia is among countries where Cassava is widely grown in Africa. Evidences from SNNPR bureau of Agriculture shows that the crop is widely cultivated in the low land areas of the region. The current development policy and strategy has also targeted the crop for poverty reduction and food security goals for resource poor farmers at household levels. Thus, it encourages market oriented production via accessing appropriate markets for farmers produce and thereby increasing marketable surplus (Amsalu N, 2006).

Moreover, in the realm of economic growth, markets may provide the incentives for-profit-maximizing participants to develop new technologies, products, and sources of supply, new markets and new methods of exploiting them. Markets can also provide a mechanism of surplus extraction and inter-sect oral resource transfers, most commonly from agricultural to non-agricultural sectors. Further, the development and expansion of markets can create increased demand through various means. For example, markets provide a source of productive employment and income generation (Scarborough and Kydd, 1992).

Production of cassava by smallholder farmers of the Wolaita zone is mainly for market and consumption. The production is mainly subsistence and there are years surplus is produced and also drought years. Cassava production in wolaita zone is mainly constrained by seasonality where surplus at harvest is the main characteristics of the product. The nature of the product on one hand and lack of organized marketing system on the other often resulted in low producers' price. Moreover there is a need to employ a market chain approach to fully understand and resolve the problem of cassava production at all levels.

This study is designed to address the prevailing information gap on the subject and contribute to proper understanding of the challenges and assist in developing improved market development strategies to benefit of smallholder farmers, traders, and other market participants.

Material and Method

Description of the Study Area

Wolaita zone is located 390km southwest of Addis Ababa following the tarmac road that passes through *Shashamane* to *Arbaminch*. Alternatively, it is located 330km southwest of Addis Ababa following the tarmac road that passes through *Hosanna* to *Arbaminch*. *Wolaita Sodo* is the town of the zone. It has a total area of 4,541km² and is composed of 12 *woredas* and 3 registered towns. It is approximately 2000 meters above sea level and its altitude ranges from 700-2900 meters. The population of *Wolaita* zone is about 1,527,908 million of which 49.3% are male and 51.7% are female (WZFED, 2013). Out of these, 11.7% live in towns and the rest

88.3% live in rural areas.

Sampling Techniques

Two Potentially cassava producing woredas was purposively selected out of the total 12 woreds in wolaita zone based mainly on their maximum area of land allocated for cassava. Similarly kebelas was selected from respective woreds. Then, producers from a complete and separate list of cassava producers in each kebeles was prepared. Finally, based on proportional probability sampling the total number of respondents will be determined by using the formula, as indicated in (Hillocks et.al. , 2002).

The following formula was used to calculate sample size:

$$n = \frac{N}{1 + Ne^2}$$

Where; n: designates the sample size the researcher uses;

N: designates total number of households in six Kebeles =9286

e: designates maximum variability or margin of error =0.09

1: designates the probability of the event occurring

Data Gathering Tools

To gather data for the research, semi-structured and structured questionnaire, interview, group discussion and secondary data (document) analyses was used.

Data Gathering Procedure

A pre-tested and semi-structured schedule or questionnaire were designed to collect data on marketing channels, costs, price of cassava, and constraints or problems of cassava value chain. Enumerators with education level of diploma and degree were recruited and trained mainly concerning technique of interviewing. Key informants survey was made to identify the prospects and constraints on cassava production, the effectiveness of production, marketing constraints, credit facilities, availability of extension services, access to and availability of market information and marketing cost. Moreover, secondary data related to market fees, facilities and services were collected from the Woredas' and Wolaita Zone Office of Agriculture and other relevant sources.

Method of Data Analysis

The collected data was organized and analyzed using SPSS (Version, 20) and STATA (version 11). Descriptive statistics such as mean and percentage was used to summarize the data and presented in the form of Table and map.

RESULTS AND DISCUSSION

Age and family size of the respondents

Regarding age of the respondents it ranges from 24 to 65 years. The overall mean age of the respondents was 38.18 years with standard deviation of 10.489. From this result, we can see that most cassava producers were adult. Youngest might have been engaged in off/non-farm activities than production and managing of casava. The average family size of the sampled respondents was 5.68 persons and the standard deviation is 2.310, with maximum and minimum of 15 and 2 persons respectively (Table 1).

Table 1: Distribution of respondents by age and family size.

Variables	Mean	Sd. Deviation	Minimum	Maximum
Age of households	38.18	10.489	24	65
Family size	5.68	2.310	2	15

Source: survey result, 2015.

Livelihood and Farming System of the Households

Farming is the major livelihood system for the majority of the sample households in the study area as depicted in Table 2. About 74.4 % of sample households use farming as the major means of sustaining life in the area and the remaining 21.5 %, 2.5% and 1.6 % use farming together with the trading, farming together with carpentering and farming together with the office working, respectively, as a means of livelihood.

Table 2: Livelihood of sample respondents

Livelihood system	N	%
Farming	90	74.4
Farming and trading	26	21.5
Farming and carpenting	3	2.5
Farming and office working	2	1.6
Total	121	100.0

N= frequency, %= percentage

Source: Survey result (2015)

Inputs used for cassava production

Majority of sample cassava producers use local cassava variety for their production. Some portion of sample households used improved cassava variety together with the local variety. As shown in Table 3, about 75.2% and 24.8% of sample households use local variety and local variety with the improved variety, respectively. The survey has further revealed that no cassava producer use only improved variety for production. Farmers in the study area use different types of inputs for cassava production. The main types of inputs used for cassava production in the study area may include family labor, compost/farmyard manure, canopy (stem of cassava) and rain water during summer season.

Table 3: Cassava varieties used by households in study area

Types of cassava variety	N	%
Local variety only	91	75.2
Local and improved variety	30	24.8
Improved variety	0	0
Total	121	100

Source: Survey result (2015)

As depicted in Table 4, about 18.18, 2.48 and 13.23 percent of sample households in the study area use compost/farmyard manure, DAP, a combination of compost/farmyard manure and DAP, respectively as input for cassava production. The survey has further revealed that about 57.85 % of sample households did not use any input for cassava production because they assume that cassava do not need any input after it has reached at maturity stage. Application of compost/farmyard manure in circular form around the stem of cassava tree during the sunny season is the common practice in the study area. During the rainy season 8.26 % of the respondent farmers divert the rain water by digging in circular form around the cassava tree which capable it to reduce transpiration and keep it evergreen during sunny season. The survey has further indicated that 2.48 percent of the cassava producer in the area used inorganic fertilizer for cassava production.

This finding is in agreement with the Benesi et.al. (2011) who indicated that farmyard manure principally transported from homestead to the field mostly during the dry season and spread in the bottom of each cassava tree in circular form and chemical inputs entirely evaded neither for fertilization nor for pest treatment.

Table 4: Inputs used for cassava production in study area

Inputs	N	%
None	70	57.85
Compost/farmyard manure	22	18.18
DAP	3	2.48
Farmyard manure and DAP	26	13.23
Rain water	10	8.26
Total	121	100

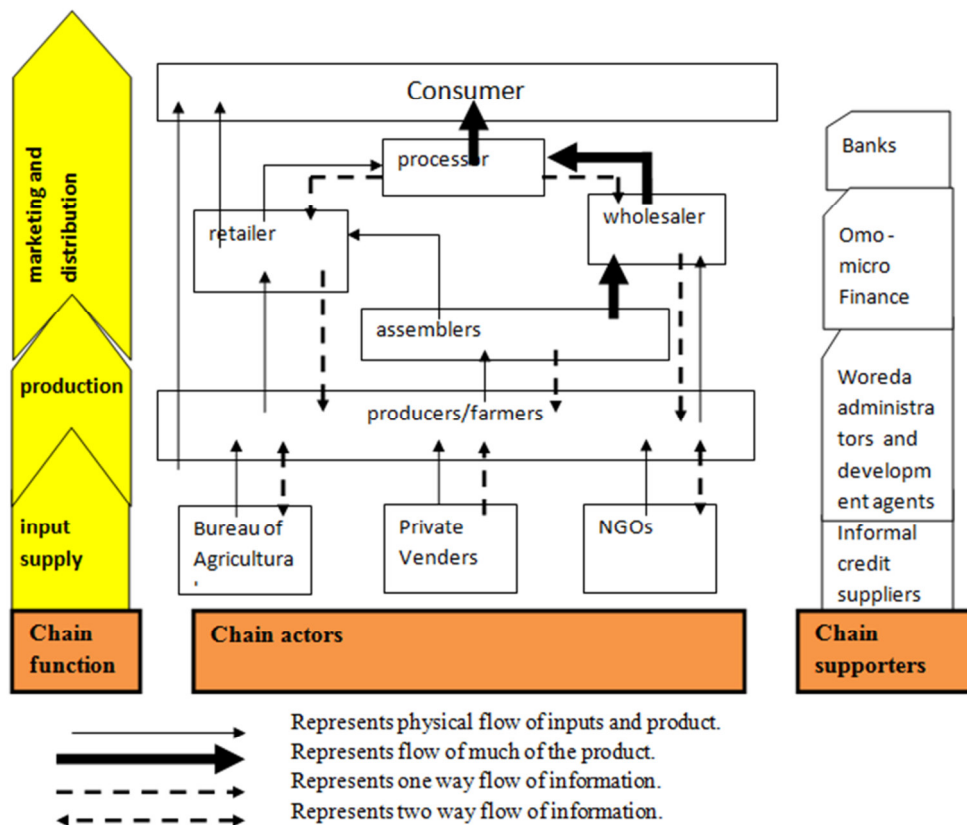
N = frequency, % = percentage

Source: Survey result (2015)

Value chain map of Cassava in Wolaita zone

According to Mazula, (2006), value chain mapping enables to visualize the flow of the product from conception to end consumer through various actors. It also helps to identify the different actors involved in the cassava value chain, and to understand their roles and linkages. Consequently, the current value chain map of cassavas in Wolaita zone is depicted in Figure 1.

Figure 1: value chain map of cassava in the study area



Actors and their role in cassava value chain

The value chain map highlighted the involvement of diverse actors who are participated directly or indirectly in the value chain. According to KIT *et al.* (2006), the direct actors are those involved in commercial activities in the chain (input suppliers, producers, traders, consumers) and indirect actors are those that provide financial or non-financial support services, such as credit agencies, business service providers, government, NGOs, cooperatives, researchers and extension agents.

Primary actors

The primary actors in cassava value chain in Wolaita zone were seed and other input suppliers, farmers, traders and consumers. Each of these actors adds value in the process of changing product title. Some functions or roles are performed by more than one actor, and some actors perform more than one role.

Input Suppliers

At this stage of the value chain, there are many actors who are involved directly or indirectly in agricultural input supply in the study area. Currently NGOs, Agricultural office and private input suppliers are the main source of input supply. All such actors are responsible to supply agricultural inputs like improved Cassava varieties, fertilizers and farm implements which are essential inputs at the production stage. For major cassavas produced in Wolaita zone, the majority of the sample producers used their own cassava stem (Table 5). Regarding fertilizers, some farmers used only organic fertilizer (manure and compost) while some farmers used both inorganic and organic fertilizers depending on the land size allocated to cassava, cassava type produced and the soil fertility status as perceived by the farmers.

Table 5: Source of Cassava Steam in the Study area

Source of steam	Number of respondents	Percent
Own steam	76	62.8
Other farmers	23	19
NGOs	22	18.2

In the study area 19% of sample farmers used/bought/ cassava stem from other neighboring farmers and 18.2% of the sample farmers get cassava stem from NGOs which is improved varieties that is tested by research center and agricultural office and use together with the local cassava. In Wolaita zone most of sample

respondents (62.8 %) use own Cassava stem which is not improved/local for production (table 5). The reason indicated for not using improved seed from known source were unavailability of improved seed, shortage of supply and its high price. The rate of fertilizer application was low. The reason indicated for not using fertilizer to cassava field and low rate of fertilizer application was high fertilizer price and cassava by its nature can give output in its production without fertilizer.

Producers

The major value chain functions that cassava growers perform include plowing, planting, fertilization, irrigating, weeding, harvesting and post harvest handling.

The diverse agro-climatic conditions can make growing cassava crops highly cost-effective and competitive, and provide vast opportunities in study areas. Unfortunately, these opportunities have not been exploited by the farmers due to the lower price they receive for their produce in the markets, as well as bearing the cost of post-harvest handling.

Table 6: value addition and irrigation use

Variables	Items	Numbers	Percentage
Value addition	Yes	36	30
	No	85	70
Irrigation	Yes	41	34
	No	80	66

Source: Own computation from survey result, 2015

Cassava production was based on rain fed and irrigation system. In Wolaita zone 34 % of the respondents used irrigation and 66 % of the respondents not used irrigation for cassava production.

Rural - Assemblers

These are traders in assembly markets who collect cassava from farmers in village markets and from farms for the purpose of reselling it to wholesalers and retailers. They use their financial resources and their local knowledge to bulk cassavas from the surrounding area. They play important role and they do know areas of surplus well. Collectors are the key actors in the cassava value chain, responsible for the trading of 33 percents of cassava from production areas to wholesale and retail markets in the study areas. The trading activities of collectors include buying and assembling, reducing the size, drying, repacking, sorting, transporting and selling to wholesale and retail markets.

Wholesalers

Wholesalers are mainly involved in buying cassava from collectors and producers in larger volume than any other actors and supplying them to processors. They also store product, usually for a maximum of three days. The Survey result indicated that wholesale markets are the main assembly centers for cassava in their respective surrounding areas. They have better storage, transport and communication access than other traders. Almost all wholesalers have a warehouse in a market either self owned or rental basis. They are located in Gassuba, Kindo koysha, sodo (Markato), Hawassa and Addis Ababa market.

Retailers

Retailer involvement in the chain includes buying of cassavas, transport to retail shops, grading, displaying and selling to consumers and processors. Retailers are key actors in cassava value chain in Wolaita zone. They mostly buy from assemblers and sell to urban consumers and processors. Sometimes they could also directly buy from the producers. Consumers usually buy the product from retailers as they offer according to requirement and purchasing power of the buyers.

Consumers

Consumers are those purchasing the products for consumption. About two types of cassava consumers were identified: households, and institutions which give services such as higher education institutions, hospitals, etc. The private consumers are urban and rural dwellers who purchase and consume cassava either the raw cassava or enjera and bread from cassava. Private consumers purchase cassava directly from producers, retailers and processor. Though most of the consumers purchase from retailers. Farmers also make important segment of the rural consumers since they consume part of their produces. Institutions purchase their product from wholesaler who has the capacity to supply sustainably based on contractual agreements. Consumers prefer medium size and free from damage; and medium size cassava. In general consumers have their own quality criteria to purchase cassava.

Supporting actors

Such actors are those who provide supportive services including training and extension, information, financial and research services. According to Scott, (2007), access to information or knowledge, technology and finance determines the state of success of value chain actors. Wolaita zone agricultural office, Omo- micro finance, NGOS and Banks are main supporting actors who play a central role in the provision of such services.

Woreda Agricultural Office: This is the governmental institution which provides extension service for small scale farmers in agricultural sector in the study area. This organization provides various extension services specifically in cassava sector in the study area. The major services which this organization is providing in the cassava sector are provision of improved cassava variety, compost application, harvesting and post harvest handling, and provision of improved harvesting material. The assessment has further indicated that despite extension service is providing technical advice in cassava sector, provision of extension service is not covered the whole farming families in the study area.

Woreda Agricultural product Marketing and Cooperative Office: This is also governmental organization which provides marketing services in the certain stages of cassava value chain in the study area. This organization provides services like quality control, licensing, and market place for wholesalers, collectors and retailers. The organization provides license to wholesalers emerging from the near area and certifies licensed cassava traders to secure their freely involvement in cassava transactions. At the same time, the organization prohibits direct entry of unlicensed cassava traders in order to uphold the rights of traders who have been licensed. Inters of quality control, the organization prohibits traders who collect and dry cassava on the ground without using plastics or sack which totally changes the color of cassava. By performing all this responsibilities, the organization enables cassava marketing environment for the traders and sets rules and regulations guiding traders in the study area. But, the study has further indicated that some cassava traders like collectors act illegally by drying cassava on the ground without using plastics or sack and enter into the business without receiving trade license from the woreda agricultural product marketing and cooperative office.

Omo-Micro Finance Institution (OMF): This is a non-governmental organization which provides credit and saving services to cassava producers, assemblers and retailers in the study area. The organization first provides credit to the farmers for capital investment in cassava processing in annual base and in the second term allows farmers to save a certain portion of income obtained from their involvement in cassava processing. The organization also provides credit service for cassava assembles, retailers and wholesalers as initial capital.

Ethiopian Catholic Church: This is also the non-governmental organization which is working in the cassava sector in the study area in collaboration with the Wolaita zone Agricultural Office. This organization emphasizes on promotion of major product of the particular community to the national market thereby linking particular producers with the market and upgrading of cassava. In addition to this, the organization is working in capacity building of the farmers on small scale cassava processing.

Value chain governance

The dominant value chain actors play facilitation role. They determine the flow of commodities and level of prices. In effect they govern the value chain and most other chain actors subscribe to the rules set in the marketing process. The study result indicates that the processors and wholesalers assisted by the rural assemblers are the key value chain governors. Gassuba market is heavily dependent on hawassa for cassava processes, and therefore the cassava value chains are highly influenced by cassava processing in hawassa. In most cases, the business relations between the various operational actors are of free market exchange and uncoordinated. Due to the lack of a proper market information system and minimal bargaining power, farmers are forced to sell their product at the price offered by traders. Traders in Gassuba Woreda usually refer to hawassa markets for price fixation and in kindo koysha Woreda price is fixed by wholesalers. There is no vertical linkage between value chain actors but there is horizontal linkage between traders. In some cases, there are conflicts among the traders regarding payment and failure to keep their commitment. Overall, the governance of the cassava value chain is buyer driven with minimum trust between various actors. Traders are always complaining that the farmers are not providing quality product while farmers are blaming the traders for offering low prices. The smallholder farmers are not organized and are not governing the value chain. Hence, they are price takers and hardly negotiate the price due to fear of post harvest loss, in case the product is not sold.

CONCLUSION AND RECOMMENDATION

Cassava sub-sector is a good entry point for tackling poverty and that the market for Cassava is significant and growing in Ethiopia. In Wolaita zone Cassava is one of potential root crop which has a significant contribution to the livelihood of small scale farmers and creates business and employment opportunities for the many firms and commercial agents in the area. This study was carried out with the main objective of identifying mango value chain actors and their respective functions, identifying value chain map and value chain development and upgrading strategies of cassava in wolaita zone.

In line with the objective of the study there are direct and indirect actors who can take their part in each and every stages of the Cassava value chain in the study area. The direct actors of Cassava value chain are input suppliers, producers, collectors, wholesalers, retailers, processors and consumers. The indirect actors of Cassava value chain in the study area are both governmental and non-governmental organizations such as Agricultural Extension Centre, Marketing and Cooperative Office, Trade and Industry Department, Wolaita development association and Omo Micro-Finance (OMF). Each of these actors adds value in the process of changing product title. Each of the Cassava value chain actors adds value to the product as the product passes from one actor to another. In a way, the actors change the form of the product through improving the grade by sorting, cleaning or washing or create space and time utility. In addition to this, major value adding activities performed by the Cassava value chain actors include provision of inputs, production, sorting, drying, processing, transporting and distributing.

Based on the result obtained from the current study the following are anticipated to be done for the further improvement of mango value chain in the study area.

Capacity building of farmers on agronomic practices like orchards spacing, technological application, use of improved Cassava varieties and overall farm management are key to the development of the cassava value chain thereby improving cassava production system. Strengthening of agricultural extension service in dissemination of improved cassava variety is quite important.

Cooperative is quite important for group marketing and promotion of farmers' bargaining power and pooling of resources for the intensive involvement of farmers' in the market. Therefore, farmers' cassava marketing cooperative should be established in the study area and programmes aimed at commercialization of cassava sub-sector should be designed.

REFERENCES

- Allem A (2002). The origins and taxonomy of cassava. CABI Publishing, Wallingford. 1: 1–16.
- Amsalu N (2006). Phenotypic Diversity of Cassava (*Manihot esculenta* Cranz.) in Ethiopia. Proceedings of the 12th Annual Conference of the CroP Science Society of Ethiopia, 22-24 May 2006, Addis Ababa, Vol. 12, Pp 23-29.
- Benesi IRM, Mahungu NM (2004). Genotype X Environment interaction effects on native cassava starch quality and potential for starch use in the commercial sector. *Afr. J. of Crop Sci.*, 12: 205-216.
- Hillocks, R. (2002). Cassava in Africa. In R. Hillocks, J. Thresh, & A. C. Bellotti, eds., *Cassava Biology, Production and Utilization*. CABI Publishing.
- KIT, Faida Mali and IIRR, 2006. Chain empowerment: Supporting African farmers to develop market. Royal Tropical Institute, Amsterdam; Faida Market Link, Arusha; and International Institute of Rural Reconstruction, Nairobi.
- Mazula, R., 2006. Commodity Chain Approach and Deal Structuring: An Agri- Business Case Study in Zimbabwe Progress Fund. PP.73-78, Zimbabwe.
- Scarborough, V. and J. Kydd, 1992. *Economic Analysis of Agricultural Markets. A Manual of Marketing Series 5*, Chatham, UK: Natural Resource Institute: 172p.
- Scott, J., 1995. *Price, products, and people analyzing agricultural markets in Developing Countries*, Lynne Rinner Publisher, and London. 498p.
- WZFEED (Wolaita Zone Finance and Economic Development), (2013). *The 2013 Yearly Report on Wolaita zone and Rural Woredas' Economy*, Unpublished.