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Value Chain Analysis of Horticultural Crops in Kombolcha District of Eastern Oromia, Ethiopia

By

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Synthesis Report

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EXECUTIVE SUMMARY

This synthesis is based on the study commissioned by Action Aid Ethiopia and conducted by the author in Kombolcha district in May 2008. The aim of the study was assessing the horticulture value chain, understanding the major constraints of horticulture production and marketing in Eastern Ethiopia and opportunities to improve them. A survey was conducted using structured and semi-structured questionnaires to collect primary data from 150 producers and 60 consumers. Moreover, PRA tools were used to collect information from groups and key informant producers, traders, transporters, exporters and institutions. This synthesis presents the key findings of the study. The main purpose of the synthesis is to inform the concerned stakeholders and policy makers about the status of horticulture value chain in the region and motivate them to take measures that can improve the chain efficiency.

Production: Different types of vegetables are grown in the study area with different intensities in terms of input, purpose of production, and marketability. The most commonly grown vegetables in terms of the number of growers are Irish potato, cabbage, carrot and beet roots. Potato is the most widely marketed vegetable. Vegetables provide the most intensive use of land resource where some farmers produce vegetables in three cycles within the same year. Cycle I and II use irrigation system, which is pumping of water from hand- dug wells. Horticulture production makes use of inputs such as fertilizers (also animal manure), improved seeds and pesticides. Farmers rely on own sources for potato seed supply and purchase seeds of other vegetables from the market.

Vegetable supply and demand: During the year 2007, an estimated total of 421,725 qt of vegetables were marketed at Kombolcha market. Potato accounted for about 70% of the vegetables marketed. About 75% of the potatoes were supplied from east Hararghe and about 25% from central Ethiopia including the Rift Valley and Shashemene. The supply from other parts of the country is seasonal; often needed to bridge the gap between demand and supply. The potatoes supplied from the central part of the country are considered inferior in terms of quality and sold relatively cheaper. Kombolcha, Jarso and Haramaya districts supply sufficient quantity of carrots, beetroots and cabbages and these commodities are not supplied from other sources. About 94% of the vegetables marketed in Kombolcha were exported to Somalia.

Market actors along the value chain: The marketing channel in the horticulture marketing system can be broadly categorized into four levels, namely the producers, the middlemen/brokers, traders and consumers. Along the marketing channels, there are different actors contributing to complementary marketing functions including production, facilitation, buying and selling, transporting, packing, sorting and processing, etc. However, Kombolcha vegetable marketing is characterized by poorly developed marketing functions such as packaging, sorting and processing. The sense of value adding was practically not observed. Only space utility which is created as goods move from production to consumption center is created.

Farmers manage only the supply side of the value chain and hence less empowered in terms of price negotiation. Traders and brokers in Kombolcha set the prices the farmers get and the exporters to Somalia set the prices the traders should get. In both cases, the value chain actors are

disadvantaged except, perhaps the exporters. This is a situation of powerful actors in the value chain due to lack of organization of the traders or producers in the supplying country.

Marketing margin: The price of vegetables increases as the products change title. The farmers get the least price, followed by the wholesalers and then the retailers. There is 5-10 Birr margin between the price received by the wholesaler and retailers within the same market. However, the price of vegetables increases as the distance between production and market centers increases. The marketing margin is narrower within Kombolcha and among the local value chain actors than when the product is exported. In Kombolcha, the trader's margin is 13% while at Hargessa it increases to 50%. In Bosasso the margin increases to 82%. Increasing producers and local traders' role in the chain management will enable them benefit from the high marketing margin the exporters get.

Production constraints: The major horticulture production constraints are related to production and product management. The major constraints include lack of improved potato varieties and relying on own seed, high fertilizer and food prices, high price of fuel for pumping water for irrigation. Institutional factors in terms of provision of inputs and extension services and poor infrastructure are also limiting.

Marketing problems: The major constraints of marketing include lack of markets to absorb the production, low price for the products, large number of middlemen in the marketing system, lack of marketing institutions safeguarding farmers' interest and rights over their marketable produces (e.g. cooperatives), lack of coordination among producers to increase their bargaining power, poor product handling and packaging, imperfect pricing system, lack of transparency in market information system mainly in the export market.

Policy constraints: The most important policy concerns impacting on horticultural crops production and marketing in the eastern part of the country include restrictive policy environment along Ethio-Djibouti route, absence of policy instrument that governs Ethio-Somali market relation and limited capacity to enforce the existing policy related to quality standard and control.

Recommendations: The most crucial action to be taken is organizing the traders (local and exporters) and the producers to work as partners not as rivals so as to mutually benefit from participation in horticulture value chain. Building their business capacity and overcoming their constraints and capacitating them to use market information are important. Putting the market right through institutionalizing the commission agents' functioning, grading and standardizing, improving the export system by improving the transparency in the price setting and credit system are crucial interventions. Finally, the government should review the horticulture export prices to Djibouti, which is determined through negotiations.

1. INTRODUCTION

1.1 Background

More than 85% of the Ethiopian population, residing in the rural area, is engaged in agricultural production as a major means of livelihood. However, the agricultural productivity is low due to use of low level of improved agricultural technologies, risks associated with weather conditions, diseases and pests, etc. Moreover, due to the ever increasing population pressure, the land holding per household has been declining resulting in low level of production. The Hararghe highland is one of the highly populated areas in Ethiopia. As a result, intensive horticultural production has become a means of promoting agro-enterprise development and increasing the land productivity. Horticulture production gives an opportunity for intensive production and increases smallholder farmers' participation in the market (Emana and Gebremedhin, 2007).

Eastern Ethiopia, especially eastern Oromia has a comparative advantage of producing vegetables due to its high domestic and export markets. East Ethiopia has access to export markets in Djibouti, Hargesa, Wuchale, Bosaso and domestic markets in Harar, Dire Dawa, Jijiga, etc. Despite this potential, the farmers in the area rarely utilize the opportunity to improve their livelihoods. The smallholder producers are price takers since they have little participation in the value chain and imperfection of the marketing system. As a result, smallholder farmers have repeatedly faced risk of unexpected fall in horticultural product prices. This means that the value chain is not fairly linked and both the producers and consumers lose in the transaction.

This synthesis is, therefore, extracted from the study conducted in eastern Hararghe in general and Kombolcha district in particular with the objective of informing the stakeholders to understand the situation and motivate them to take necessary measures to improve the marketing efficiency in the region. The main objectives of the study are given below.

1.2 Objectives of the study

The objectives of value chain analysis were:

- i) Conducting value chain analysis for key cash crops (potato, carrot and cabbage) in Kombolcha district;
- ii) Identifying institutional barriers that have impacts on vegetable and root crops marketing; and
- iii) Identifying key policy issues for intervention.

1.3 Scope and limitation of the study

The destination of the largest quantity of horticulture products in the eastern part of the country are markets in the neighboring countries. The time and logistics budgeted for the study could not allow an assessment of the markets in Somalia and Djibouti. Thus, the information on the external market was based only of a few key informants and secondary data. The secondary data collected at different levels sometimes show inconsistencies. In this case, the researcher was forced to rely on grassroots primary data. Despite these limitations, the findings of the research provide important basis for relevant interventions.

2. METHODOLOGY

The study area was purposively selected as high quality potato is produced in Kombolcha and Jarso districts. In addition, Kombolcha town is the major potato trading center from which the products are distributed to the Somali region of Ethiopia and exported to Somalia. The data collection intended to generate the necessary information along the horticulture production and marketing channel/chain. Accordingly information about production potentials and constraints, transportation, storage, product handling, prices, marketing systems, consumption, etc. were collected from producers, consumers, and intermediaries. Assessment of prominent institutional demand was also made.

A total of 150 sample vegetable producers were randomly selected from five Farmers Associations (FAs) of Kombolcha district for the survey. Moreover, 60 consumers (employees, traders, hotel owners and petty traders and others) were selected based on systematic random selecting technique for the consumption survey. Structured and semi-structured questionnaires and checklists were used to collect data from producers and consumers. Besides, Focus Group Discussions (FGD) and key informant interviews were made with community leaders, elders, youth, and women farmers, and members of Kombolcha district marketing council and market actors in the different markets. Discussions were also held with traders, transporters, groups involved in loading and unloading of vegetables and agents of exporters in Kombolcha town, Harar, Jijjiga and Dire Dawa towns. Vegetable markets in Kombolcha, Haramaya, Harar, Dire Dawa and Jijjiga were visited to understand the flow of vegetable products from Kombolcha district to these markets and how the markets operate. A total of 149 persons participated in the FGD of whom 106 were from producers, 24 involved in marketing, transporting, and loading/unloading services while 19 were from institutions.

Responsible institutions such as the Kombolcha Integrated Development Program Office, Zonal and District Cooperatives Promotion Offices, Zonal and district agriculture and rural development offices, Ethiopian Export Promotion Agency of the eastern region and Hararghe Catholic Secretariat which is engaged in agro-enterprise development of smallholders in the eastern Hararghe were contacted. Additional efforts were made to get vegetable market information in the terminal markets of Hargessa, Bossasso, and Djibouti through different means¹. Moreover, additional data were also collected from secondary sources. The data collected from different sources including the review of documents were basis for the main report and this synthesis.

3. CONCEPTS OF VALUE CHAIN

Chains of agricultural products such as fruit and vegetables, grains and oils, textiles and cosmetics stretch from the producers to the consumers. At one end are the producers – the farmers who grow the crops and raise the animals. At the other end are consumers, who eat,

¹ Only key informants were contacted to get highlights of the market in Djibouti while a short questionnaire was sent to the Action Aid staff in Somaliland to get some primary data on vegetables imported from Ethiopia..

drink and wear the final products. In the middle are several individuals and firms, each performing one small step in the chain: transporting, processing, storing, selling, buying, packaging, standardizing, controlling quality, monitoring, making decisions, etc. Other players also have a key role: the banks provide loans and arrange payments, the government sets regulations and determines policy, information brokers keep the market players informed about prices and quantities, suppliers provide inputs, researchers produce improved varieties, and so on.

The chains can be simple when producers directly sell to the consumers but long and complex when the other actors play role in buying, processing, transporting and selling to the end user, the consumer. The complex chain however offers a multitude of choices to the farmers. They may choose to supply a specific market segment, and produce the crop or animal that is tailored to that segment. They may also try to process their produce to add value to it; they may dry chilies rather than selling them fresh, or they may make cheese rather than selling the unprocessed milk. Farmers need to understand the players in the chain and the requirements of the different branches so that they can supply the product which that branch requires. That will increase their bargaining power in the chain, and improve the price they get for their product.

The multitude of functions that are performed to produce goods and make them available for the consumers is also expressed in the concept of market chain. The market chain refers to the system that consists of actors and organizations, relations, functions, and product, cash and value flows that make possible the transfer of a goods or service from the producer to the final consumer. Figure 1 shows the market chain implying the market actors and their roles in value chain.

The actors are those involved in producing, processing, trading or consuming a particular agricultural product. They include direct actors which are commercially involved in the chain (producers, traders, retailers, consumers) and indirect actors which provide financial or non-financial support services, such as bankers and credit agencies, business service providers, government, researchers and extension agents. The actors interact through the supply or value chains. A supply chain is a set of linkages between actors where there are no binding or sought-after formal or informal relationships, except when the goods, services and financial agreements are actually transacted whereas a value chain is a specific type of supply chain – one where the actors actively seek to support each other so that they can increase their efficiency and competitiveness.

Figure 1: Structure of a value chain



Source: KIT, et Al. (2006).

According to KIT, et al. (2006), farmers who are involved in the supply chain functions have little negotiating power and make little money and have no incentive to improve their products, in which cases the traders face a great deal of risk and can buy only low-quality produce. Through their associations, farmers can negotiate a deal with a trader who buys a certain amount of high-quality product. The trader in turn has a contract with the end users/consumers. The function through which each actor is prepared to invest and support other actors to maximize the benefit from the chain performance is known as a value chain. This makes the chain to function smoothly and develops the sense of benefiting by all actors from having a smooth supply of top-quality products in a sustainable manner.

Farmers may concern themselves only with production: they prepare the land, plant the seeds, apply fertilizer, control pests and weeds, and harvest the crop when it is mature. But they may also be involved in other activities such as procuring inputs, drying their crop, sorting and grading, processing, transporting and trading and increase the chain of their activities. These chains of activities will create vertical integration of the activities and make farmers to participate in value chain management rather than only in the supply chain. This in turn increases farmers' comparative advantage by increasing the volume of supply, quality of the product and consistency of supply, which is often possible when farmers act as a group (Linda Mayoux, 2003).

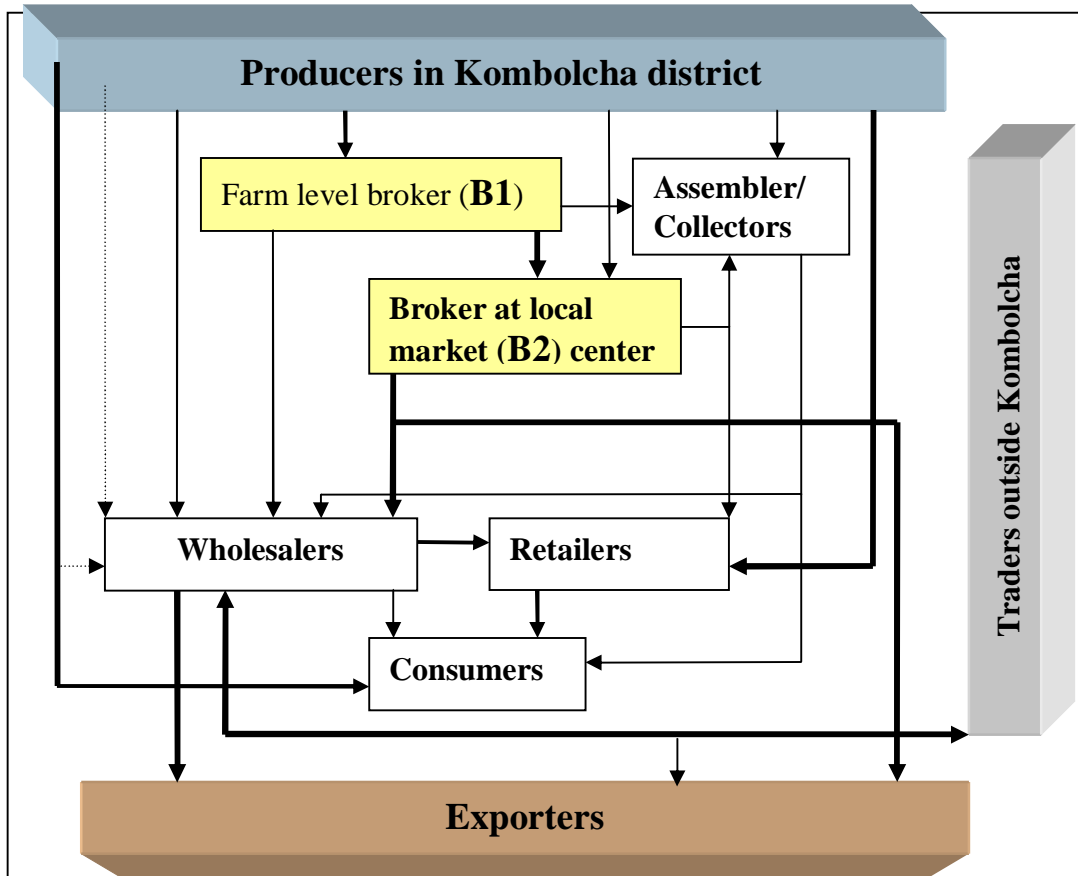
In the case of horticulture value chain in the study area, the supply chain (represented by production), marketing and distribution chains and consumption are predominant. Value addition through processing and adequate standardization and packaging are missing. The findings of the study reflect this reality as discussed below.

4. FINDINGS AND DISCUSSIONS

4.1 Major actors of the value chain

The marketing channel in the horticulture marketing system can be broadly categorized into four levels, namely the producers, the middlemen/brokers, traders and consumers. There are different brokers and traders with different roles in the marketing system (Figure 2). Along the marketing channels, there are different actors contributing to complementary marketing functions.

Figure 2: Major market actors along the market channel in Kombolcha market, east Hararghe



Source: Own sketching based on the market survey (May 2008)

These marketing actors are producers, collectors, brokers, retailers, whole sellers, exporters and consumers. The functions of the market actors include production, facilitation, buying and selling, transporting, packing, etc. The Kombolcha vegetable marketing is characterized by poorly developed marketing functions such as sorting, packaging and processing. The sense of value addition is practically does not exist. As the horticulture products move away from the producers to the consumers, the actors add space utility by making the goods available rather than value addition through processing or preservation.

4.2 Production and productivity

4.2.1 Production system

Land resource is a critical factor of production in the study area. The landholding of the sample respondents ranges from 0.03ha to 1.13ha with an average of 0.38 ha per household. As a result, land use is highly intensified. Three seasons (cycles) of production of vegetables have been identified in the Kombolcha district:

- Cycle I (February to April): Horticultural production is practiced using irrigation. In Kombolcha, farmers have developed hand dug wells to pump water for irrigation. The irrigation practice is highly labour intensive and also requires financial resources for purchasing fuel. It was also found out that the vegetables grown using irrigation attract relatively high price.
- Cycle II (May to October): Horticulture is produced using rainfall. During this season, cereal crops, pulses and oil crops are produced. It is typical in Hararghe that maize, sorghum, haricot beans, vegetables, etc are intercropped with other annual crops or khat.
- Cycle III (November to January): This follows the main rain season and vegetables and roots crops are produced using irrigation.

Vegetables are more intensively grown than cereals (Table 1). Potato is the most commonly grown crop during the three production cycles. Relatively larger number of farmers produces potatoes during the three production cycles followed by cabbage and beetroots. As observed during the focus group discussions, the supply of vegetables such as cabbage, carrot and beetroots from Kombolcha district is sufficient to meet the annual demand of the Kombolcha market, also due to low demand for the leafy vegetables. However, the supply of potatoes fall short of meeting the demand, as explained in the subsequent sections.

Land is more intensively used in the production systems I and II where relatively larger proportion of the farmers are engaged in horticulture production during the three cycles. Obviously, khat is harvested throughout the year, though only the farmers who can irrigate the plant during the dry season can sell the product at higher prices. Coffee is harvested in the production system III. Moreover, about one-third of the land could be irrigated and 80% of the sample households irrigated part of their farmlands.

Table 1: Crop area, production and yield of crops during 2007

Crop type	Cycle I (Feb-April)			Cycle II (May-Oct)			Cycle III (Nov-Jan)		
	Area (ha)	Production (qt)	Yield (qt/ha)	Area (ha)	Production (qt)	Yield (qt/ha)	Area (ha)	Production (qt)	Yield (qt/ha)
Irish potatoes	0.09	10.7	112.91	0.11	13.1	115.92	0.09	11.8	135.4
Carrot	0.05	8.6	170.10	0.05	6.0	115.20	0.05	15.1	276.6
Cabbage	0.04	14.4	325.22	0.04	11.7	268.20	0.06	15.3	262.5
Beetroot	0.04	5.3	150.59	0.04	5.4	134.40	0.04	4.9	126.2
Maize				0.17	4.66	28.21			
Sorghum				0.19	3.84	19.95			
Haricot beans				0.20	0.58	2.91			
Groundnuts (unshelled)				0.09	2.96	32.0			

Source: Own survey (May 2008)

Intensity of use of inputs determines the production and productivity of horticultural crops. Intensities of key factors of production such labour, seeds, chemical and organic fertilizers and pesticides have been determined per ha of land used for potato and khat. Depending on the season, 224-311 man-days of labour was used per ha of potato produced during the year 2007. Labour is also a major means of land preparation mainly in the highly intensified intercropping system. The seeding rate shows only slight variation with an average of 22 qt/ha. The fertilizer demand is also high with an average of 2.5 qt of urea and DAP per ha of land, which is higher than the amount needed per ha of cereals. Fertilizer is also applied to khat production but at smaller rate than it is used for potato production. In addition to chemical fertilizers, farmers also apply organic manure to enhance yield. The amount of inputs used for the production of the two major marketed products in Kombolcha is shown in Table 2.

Table 2: Intensity of input use for potato and khat (Unit/ha)

Input (unit)	Potato			Khat
	Cycle I	Cycle II	Cycle III	
Labour (Md)	311	224	246	136
Seed (kg)	2,566	1,938	2,467	
Urea (kg)	251	195	368	162
DAP (kg)	287	244	253	231
Manure (joniya)	259	350	253	192
Irrigation (Birr)	2,415		3,291	2,871
Chemicals (Birr)	933	717	1,082	313

Source: Own survey (May 2008)

It was also found out that irrigation water supply which requires investment in pumping motors and fuel is crucial factor determining the timing of vegetables and khat production and the level of income generated from production. Irrigation is highly needed during Cycles I and III vegetable production and khat production. During the 2nd cycle of production, farmers rely on rainfall and only few farmers supplement their production with irrigation. About 55% and 60% of the sample farmers used irrigation during the 1st and 3rd cycle of vegetables production, respectively. About 47% of the irrigation users applied it for potato production during both production cycles while some 21-23% used irrigation for khat production. The majority of the irrigation users applied only up to 6 times, which farmers reported as not enough. Rehabilitating the hand dug well and high cost of fuel for pumping water constrain the use of irrigation in the area.

4.2.2 Productivity

Analysis of the productivity of crop enterprises helps to indicate direction of investment alternatives. Table 3 compares the productivity of potato and khat production per ha of land. As discussed above, potato can be produced in three cycles during a year. This will permit crop rotation and effective use of land. Based on the survey data, the costs of production and returns at the prevailing prices were used to estimate the benefits.

The labour input given in Table 2 was valued at Birr 20 per man day and the potato seeds were valued at market price of Birr 262, 106 and 327 per qt during the 1st, 2nd and 3rd production

cycles respectively. These prices were the actual average figures paid/received by the producers during these periods. Urea and DAP were valued at Birr 432 and 482 per qt respectively. Based on the PRA finding, manure was valued at a cost of Birr 5 per joniya². Irrigation and chemical costs were reported by the sample respondents. Income from khat represents the sales income from khat while the income from potato is the value of total production at the prevailing price.

Accounting for the costs of these resources, a farmer receives an average gross margin of Birr 43 per qt. The return is the lowest during the second production cycle due to low price of the commodity. The total average cost of production of potato is Birr 139 per qt while it reduces to Birr 98 if the opportunity cost of labour is not considered and return to labour is the main interest of the analysis. The cost calculation gives a clue to the extent farmers' benefit from the value chain of the product they produce.

The overall analysis shows that khat requires smaller production cost and also gives smaller net return per ha of land, compared to potato. But it should be noted that khat is often intercropped and the data available do not permit a controlled case where land is used only for khat production.

Table 3: Cost-Benefit of potato and khat production (Birr/ha)

Variables	Potato				Khat
	Cycle I	Cycle II	Cycle II	Total	
Labour	6,215	4,482	4,930	15,627	2,723
Seed	6,724	2,054	8,068	16,846	
Urea	1,083	844	1,590	3,517	700
DAP	1,382	1,178	1,221	3,781	1,112
Manure	1,297	1,748	1,266	4,311	960
Irrigation	2,415		3,291	5,706	2,871
Chemicals	933	717	1,082	2,732	313
Total cost	20,049	11,023	21,448	52,519	8,679
Income	33,876	13,997	38,081	85,954	8,725
Gross margin	13,827	2,974	16,633	33,434	10,046
Margin per qt (Birr)					231
Cost per qt (Birr) (Production and marketing)					157

Source: Own survey (May 2008)

The findings of the focus group discussion shows that if khat and potato are planted with appropriate agronomic practices, optimum irrigation and adequate fertilizer, the gross margin could be as high as Birr 100,000 per ha for khat and Birr 69,000 per ha of potato.

4.3 Supply of vegetables at Kombolcha market

Based on their experiences, traders were asked to estimate the quantity of vegetables marketed daily in the Kombolcha market. It was much easier for the traders to estimate the amount they

² Joniya is sack used to transport manure to the farm field. The unit and its price was used to estimate the cost of organic fertilizer.

sold per week to major buyers. Often trucks were loaded with sacks of vegetables and depart for different markets. Hence, the type of trucks loaded, number of sacks per truck, average weight of the sacks, frequency of selling and the duration of such transactions were inquired from different traders and the average values were presented in Table 4. It was estimated that about 294,625 qt of potato, 42,825 qt of cabbage, 62,350 qt of beetroots and 21,925 qt of carrot were traded in Kombolcha market. The products were transported to Somalia, the major market outlet, and also sold to local markets such as Harar, and local consumers.

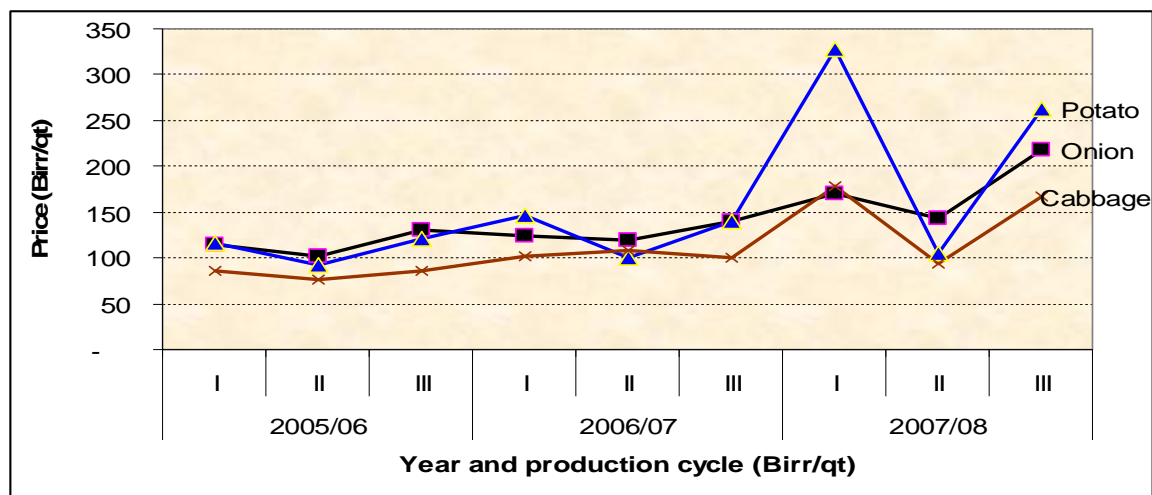
Table 4: Marketing of Horticultural crops in Kombolcha market (qt)

Type	Marketed to Somalia	Marketed at Harar market	Local consumption	Total
Irish potatoes	281,750	6,875	6,000	294,625
Cabbage	40,250	1,375	1,200	42,825
Beetroots	60,375	1,075	900	62,350
Carrot	20,125	900	900	21,925
Total	402,500	10,225	9,000	421,725

Source: Focus group discussions with Traders in Kombolcha (May 2008)

The prices of vegetables generally increased between years 2005/06 to 2007/08 and there was high seasonal variation of prices of vegetables within a given year. Several farmers produce potato during Cycle II using rainfall and the prices were at the lowest every year. Production during seasons I and III were made using irrigation system and the supply was low resulting in higher prices (Figure 3).

Figure 3: Variation and trend of prices of some vegetables at Kombolcha

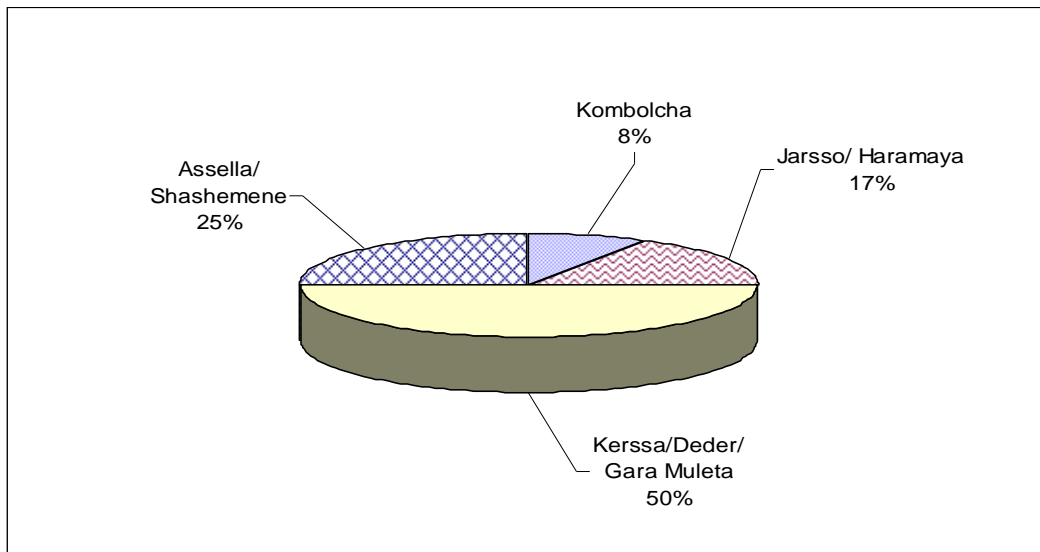


Source: Own survey (May 2008)

Potato is supplied from different sources including Kombolcha district and other districts in eastern Hararghe zone including Jarso, Haramaya, Kurfachalle, and Deder. During the slack seasons, potato was also purchased from the rift valley and central highlands of Ethiopia. Traders estimated the supply of potato from Kombolcha district at about 8% of the total marketed supply

(Figure 4). Jarso district which is adjacent to Kombolcha produces good quality potato sold primarily at Kombolcha market. The supply from Haramaya district was exported partly through Dire Dawa to Djibouti or to Jijiga, Harar or to Kombolcha. It was also indicated that vegetables such as cabbage, beetroots and carrot marketed in Kombolcha were solely supplied from Kombolcha, Jarso and Haramaya districts.

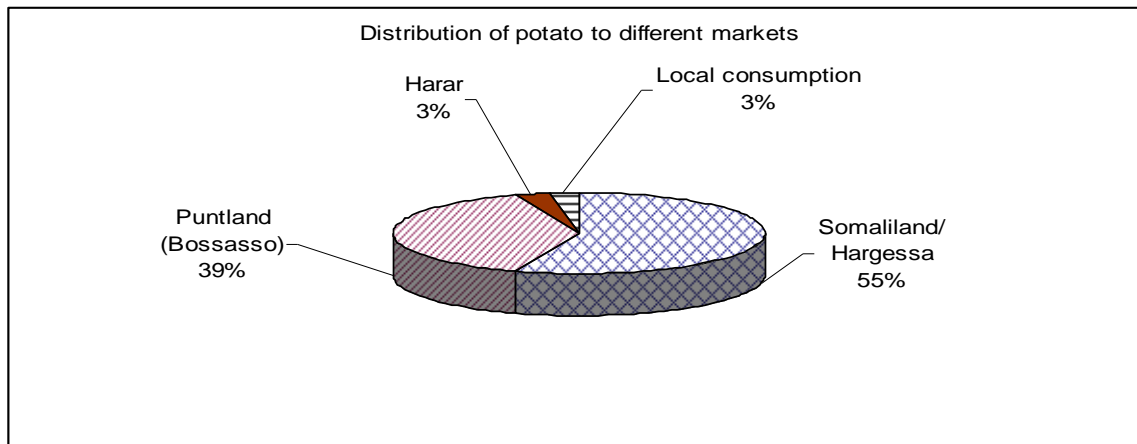
Figure 4 Supply sources of vegetables to Kombolcha Market (%)



Source: Focus group discussions with Traders in Kombolcha (May 2008)

The traders also estimated the destination of potato shipped from Kombolcha market. As shown in Figure 5, the major share of the product was exported to Somalia (55% to Somaliland and 39% to Puntland). Local consumption in Kombolcha accounted for only 3% while another 3% was sold to consumers in Harar. Generally, all superior quality potato supplied from Kombolcha and Jarso was highly demanded in Somalia due to its relatively high storability, and good taste. Hence, it is potato of low quality (injured, small sized potato) which was sorted out and sold locally.

Figure 5: Market shares of potato supplied from Kombolcha market



Source: Focus group discussions with Traders in Kombolcha (May 2008)

4.4 Product processing, standardization and marketing facilities

Transport: Vegetables are transported from the rural areas using three means: vehicle, donkey and human power. ISUZU vehicles now penetrate into the rural areas as far as access road is available. The focus group discussion revealed that there is an increasing interest of using vehicles to transport vegetables so as to reduce damage to the products. The survey result also showed that 60% of the sample producers transported their produces by vehicle while 33% used donkeys the remaining 7% being transported by human power. The average transport cost was estimated at Birr 0.5 per qt per km.

Storage: The supply of vegetables increases during the peak harvest period and the price declines. On the other hand, techniques for storing vegetables are not known to many of the farmers. Due to the lack of improved storage facilities, farmers often sell immediately after harvesting vegetables to reduce the risk of damage/spoilage. Traders also keep vegetables only for a limited number of days. Leafy vegetables and tomatoes are sold as soon as harvested and the wholesalers and retailers may keep them for only a few days. Products like potato could be kept by the producers for up to 7 days; the wholesalers may also keep them for 7-12 days while the retailers may keep them for up to 10 days, with a total of up to 25 days all along the marketing channel (Emana and Gebredhin, 2007). The warehouses used by the traders are ordinary rooms with cemented or ground/soil floor and with no shelves. The storage facilities are in poor conditions. Cooling and preservation systems are unavailable and perhaps unaffordable. Potato is stored spread on the floor and some traders take special care to keep potatoes for about a month without quality deterioration (Emana and Gebremedhin, 2007).

Grading, standardization and packaging: In principle, regulatory instruments protect all market actors from unfair transactions. In the horticulture marketing of the study area, such norms do not exist. The price of vegetables is often fixed arbitrarily based on the judgment of the traders and/or brokers rather than the demand and supply. Exporters attempt to get uniform and

undamaged products for export and there is not as such a standard to set a significantly different price based on quality. The locally applied sorting criterion is size of potato and smoothness to sort potato for export to Somalia. Limited sorting of products was practiced. However, the way the sorting was done and the prices are set puts farmers in a disadvantageous position in the transaction because:

- There is no norm guiding the buyers and the sellers in defining quality and grading;
- There is no institution enforcing the norm;
- Sorting is done by the buyers or their agents;
- Price is set arbitrarily.

Processing: East Ethiopian horticulture marketing system suffers from lack of processing, packaging, storage and labeling. In the short run, fresh vegetables and fruits are the major form of supply to the consumers. The results of the consumers survey shows that 95% of the consumers do not want packed fruits while 96% do not want packed vegetables. They rather want fresh vegetables and fruits. It is, however, essential to improve the post harvest handling and packaging of the product.

Financing: The horticulture sector is financed through different mechanisms. Firstly, farmers finance horticulture production from their own savings. Secondly, farmers receive credit from different sources to purchase farm inputs. The survey result shows that 23% (N=150) of the sample horticultural producers received credit during the previous production year (2007). The average loan size was Birr 710 with a minimum and maximum of Birr 45 and 2,000 respectively. The majority of the farmers who received credit used it for the purchase of farm inputs such as fertilizer, seed and pesticides.

The major sources of credit for the farmers are cooperatives and micro-finance institutions. Informal loan also exists where some 13% of those who borrowed received credit from friends or relatives or neighbors. Some studies made in the area show that resource poor farmers borrow 1 qt of potato tuber for planting (equivalent to Birr 200) to pay the sum of money after harvest. Whenever the price falls to Birr 50 per qt, 4 qt of the harvest is required to repay the credit. In some instances, traders lend farmers money to buy all the produce at the harvest price (Zemedu, 2006).

Market information: The main sources of market information are traders and brokers. The majority of farmers become aware of the price upon their arrival at the market place. In most cases, the prices from the previous market days are considered when the farmers deliver the vegetables to the wholesalers without allowing remunerations for the difference in quality, seasons and the change in market conditions. Brokers often deliver information about declining prices in the terminal markets to farmers so as to convince them to receive lower prices for their products. Traders themselves lack market information outside their vicinity. Traders in Kombolcha, for instance, do not get precise information about prices in Somalia to adjust the sales prices. Lack of market information severely affected the producers since they were the ones bearing the losses sooner or later.

4.5 Export markets

According to Sisay (2004), in 2002 alone about 36 countries imported Ethiopian fruits and vegetables. About 74% of the export was imported by Djibouti. The revenue generated from the

export was Birr 11,279,211 of which 59.53% was received from the export to Djibouti. Other major importers were Sudan (5.2% of the volume and 6.6% of the value), Yemen (3.8% of the volume and 3.7% of the value), India (2.3% of the volume and 2.01% of the value), Netherlands imported 1.6% of the volume with 9% of the value while Italy imported 1.8% of the volume with 4.8% of the value. About 80% of the horticulture export was made through Dire Dawa. The report did not give adequate account of the export to Somalia since this trade was only quasi formal and the quantity exported and the income generated thereof were not recorded.

4.5.1 Export to Somalia markets

Somaliland provides export outlet for vegetables produced in the eastern part of Ethiopia. Kombolcha vegetables market is the major source of supply of vegetables to Somaliland. According to the information from ActionAid (Somaliland), 100% of the potatoes and 55% of the onion and carrots marketed in the Hargessa and Gobainmo markets of Somaliland were supplied from the Kombolcha market. It was estimated that the supply of potatoes satisfy about 80% of the demand in the area during 2008. In both markets, vegetables were marketed by wholesalers and retailers who were mainly women. The major weakness to be improved is the poor packaging of the products supplied.

The consumer price of vegetables in the Somaliland was about twice that of the price at Kombolcha market, Ethiopia. For instance, in 2008, when the price of potato in Kombolcha market was Birr 3.7 per kg, it was Birr 7.4 and Birr 8 per kg in Hargessa and Gobainmo markets respectively.

Vegetables are also exported from Kombolcha to Bosasso, Puntland. But not much was known about the market situations in Puntland. According to a key informant living in Bosasso, however, vegetables attract considerably high prices. For instance, the consumer price of one kg of potato, cabbage and tomato was Birr 20 while the unit price of onion was Birr 10 per kg in 2008.

4.5.2 Export to Djibouti

The existence of railways, road transport and air cargo to Djibouti has created a comparative advantage for the vegetables and fruits marketing. Traders in Kombolcha market prefer to trade to Somalia than to Djibouti due to inconvenient terms of trade in Djibouti and better opportunities to trade with the Somaliland. Unlike the credit based transaction of vegetables exported to Djibouti, the exporters coming from Somalia purchased on cash, which secures the payment to the local traders and thus to the producers. Exporters to Djibouti label the sacks and distribute them to the supplying traders without price negotiation, which is made only when the produces are delivered. Prior to receiving the product, exporters determine the price of the product based on the previous market price but payment will be effected only after the product is sold in Djibouti. This fact puts the producers at a disadvantageous position.

Prices for fresh fruits and vegetables exported to Djibouti were said to be fixed before 10 years based on the agreement between the Governments of the two countries. The prices were determined based on C&F (Cost and Freight) terms where transportation cost to Djibouti is covered by the exporters (Sisay, 2004). Table 5 shows the prices of major fruits and vegetables as used by the National Bank of Ethiopia for controlling foreign currency earnings from Djibouti.

The export price to Djibouti was cheaper by 55% compared to the retail prices of fruits and vegetables at Dire Dawa. Compared to the wholesale price also, the export price of vegetables and fruits was cheaper by 46% and 39%, respectively. Although the structure of Djibouti vegetables and fruits market and its performance should be investigated to understand the reasons behind the huge difference between the export and local prices, the figures obviously signifies the need for a strong review of the price agreement between the two countries.

Table 5: Fixed price of some vegetables and fruit exported to Djibouti and retail price at Dire Dawa

Vegetable	Export price to Djibouti (USD/kg)	Export price to Djibouti (Birr/kg)	Dire Dawa retail price (Birr/kg)	Dire Dawa wholesales price (Birr/kg)	Export price as % retail price at Dire Dawa	Export price as % Wholesale price at Dire Dawa
Beetroot	0.15	1.41	4	3.5	35	40
Garlic	0.28	2.63	12	10	22	26
Onion	0.22	2.07	3	2.2	69	94
Carrot	0.15	1.41	5	4	28	35
Cabbage	0.15	1.41	2.5	2.25	56	63
Potato	0.22	2.07	5	4.4	41	47
Tomato	0.28	2.63	4	3.5	66	75
Mean Vegetables	0.21	1.95	5.07	4.26	45.41	54.43
Fruits						
Orange	0.34	3.20	4	3.5	80	91
Papaya	0.19	1.79	4	2	45	89
Banana	0.19	1.79	6	5	30	36
Menderin	0.25	2.35	5	4.3	47	55
Lemon	0.16	1.50	5	4	30	38
Mango	0.25	2.35	4	3.75	59	63
<i>Amboshik</i>	0.16	1.50	4	2	38	75
Avocado	0.16	1.50	4	3.5	38	43
Mean Fruits	0.21	2.00	4.50	3.50	45.67	61.20

Source: * Ethiopia Export Agency, Eastern Ethiopia, USD 1= Birr 9.40

** Based on own observation

4.6 Local consumption

Consumers are those purchasing the products for consumption. Two types of consumers could be recognized: private consumers and institutions. The private consumers are employees, urban and rural dwellers who purchase and consume horticultural products with an average income of Birr 12,500 per annum and purchase horticultural products by 11% of their incomes. Private consumers purchase horticultural products directly from producers, agents, retailers and wholesalers though most of the consumers purchase from retailers. The majority of the consumers purchase cabbage, tomato, beet roots, carrot, onion, shallot, orange, banana, etc. Farmers also make important segment of the rural consumers since they consume part of their produces and purchase vegetable types which they do not produce to meet the nutrition

requirement of their households. The survey result also showed that, on average, 14% of potato and 25% of khat produced in 2008 were consumed by the producers.

Moreover, some institutions provide cafeteria service to serve their clients. Hospitals, universities/colleges, and clubs purchase vegetables and fruits for patients, students and members of clubs, respectively. Such institutions provide a good market outlet for vegetables since they purchase relatively in larger quantities. A good example of institutions in the study area is Haramaya University, which has more than 11,000 students for which it purchases an average of about 82 kg of vegetables per student per annum. This implies that a total of about 10,500 qt of vegetables per annum. With the increasing number of students in the higher education institutions in the area (e.g. Dire Dawa, Haramaya and Jijiga Universities), the demand for vegetables increases.

It is apparent that smallholder farmers who produce in smaller amount cannot manage and benefit from the market outlets provided by institutions since they supply only in smaller quantity and only for limited time period. Thus, farmers must have an organization with a good management to link to such organizations.

4.7 Marketing margin

A marketing margin is the percentage of the final weighted average selling price taken at each stage of the marketing chain. The total marketing margin is the difference between what the consumer pays and what the producer/farmer receives for his/her product. A wide margin usually means high prices to consumers and low prices to producers. As the main sources of market information are traders and brokers and the majority of farmers become aware of the price upon their arrival at the market place, producers usually get lower prices and consumers pay high prices for the products.

The findings of the study shows that the marketing margin is narrower within Kombolcha vegetable production and marketing value chain as compared to when the product is exported. For instance, the producers' price margin was 13% when the traders in Kombolcha sell the product given the sales price and costs shown in Table 6. The marketing margin increases as the product moves away from the production center and reaches 82% implying that the producers as well as the local traders have less empowerment in managing the value chain while the consumers in the terminal market were paying high to consume the product.

In the study area about 90% of the producers experienced selling their produces through brokers or commission agents who can represent wholesalers or exporters. Commission agents often fix the price and make the largest market margin that ranges from Birr 5 to 10 per qt (vegetables) and 10% of sales value of khat.

Table 6: Potato price margin along the value chain (Birr/qt)

Cost and price component	Producers	Traders at Kombolcha	Traders at Hargessa	Traders at Gobainmo (Somaliland)	Bosasso consumers' price
Sales price	370	425	740	800	2,000
Production cost	85				
Marketing cost					
Loading/unloading	3	5	17	17	17
Sorting		8			
Transport	10	10	56	70	136
Storage cost (container)	5	5	5	5	5
Tax			20	16	
Total marketing cost	18	28	98	108	158
Perish ability loss*		19	37	37	74
Total cost	103	417	135	145	232
Gross margin	267	9	605	655	1,768
Price margin (%)		13	50	54	82

* 5%, 10% and 20% loss original value for traders in Kombolcha, Somaliland and Puntland respectively.

Source: Own computation based on survey data and information from Action Aid Somaliland

4.8 Problems of production and marketing of vegetables

4.8.1 Production constraints

There are factors that hinder the production of horticultural products in the study area. The majority of the sample producers indicated pests, drought, and shortage of fertilizer and price of fuel for pumping water for irrigation as major constraints of horticulture production. The major constraints of vegetables production are discussed below.

- i) **Management skill:** vegetables production in the eastern part of the country is based on tradition, which is poorly supported by scientific recommendations. Inadequate farmer skills and knowledge of production and product management affects the supply. Farmers attempt to select varieties and practice traditional crop management practices. Farmers' know-how of product sorting, grading, packing and transporting has been traditional severely affecting the quality of vegetable products supplied to the market. This skill gap should be addressed to improve the quality of marketable vegetable products.
- ii) **Institutional factors** are related to the provision of improved vegetables production technologies including supply of relevant varieties, agronomic practices and improved product management techniques. The farmers have not been supported by research based practical recommendations of agronomic practices and pre- and post harvest management practices. Policies and strategies governing agricultural inputs have been set or changed without strong analytical background. For instance, despite the increase in the fertilizer prices, the usual credit for fertilizer use was abandoned. In July, however, since the rate of sales of fertilizer at 100% cash payment was very low, the Regional Government of Oromia decided to offer fertilizer credit at 50% down payment, if the farmers could not afford to pay 100% and allow some 10% of the farmers who were proven poor to get fertilizer on credit

without down payment. Unfortunately, farmers who produce maize and sorghum and who could not purchase fertilizer missed the opportunity. The study result shows that about 52% of the respondent had no access to credit due to unavailability and high interest rate and difficulty to repay the loan.

- iii) **Inadequate market information symmetry:** Adequate market information is lacking to guide production planning. There is no agency that provides vegetables demand forecast that is needed for production planning.
- iv) **Natural factors** such as rainfall, water supply, flood and pests are often beyond the control of farmers and institutions. Despite the availability of irrigation water, the utilization is traditional leading to inefficient water use.
- v) **Infrastructure** such as rural roads and means of communication for efficient flow of goods and market information is a limiting factor. Most of the rural areas were not accessible by vehicle. The products were transported to the road side by donkeys or by people. This requires longer time to reach the market and affects the quality of the products. Moreover, there was no telephone or other fast communication systems to access market information that would assist decision making.

4.8.2 Marketing constraints

Marketing constraints are related to prices and demand for the products, market information, communication, storage and perishability of the products. As shown in Table 7, low price of vegetables was the most commonly stressed marketing constraint of vegetables. This problem often depends on the season where the rain-fed production suffers from low prices due to large volume of production during the season.

Table 7: Proportion of sample producers ranking the problems of marketing vegetables (%)

List of marketing constraint	Rank of the marketing constraints					N
	1 st	2 nd	3 rd	4 th	5 th	
Lack of market	42	11	42	5	0	19
Low price of products	68	19	11	1	1	119
Lack of storage	5	21	33	28	14	58
Lack of transport	24	39	14	20	2	49
Lack of market information	17	38	29	13	2	86
Brokers intervention	32	37	16	12	3	147
Perishability	13	26	42	12	6	97
Under weighing	64	36	0	0	0	11

Source: Own survey (May, 2008)

Moreover, lack of standards and norms governing sorting of vegetables and weight of the products was another important constraint of vegetables marketing. In the study area *gonfa* (an extended volume of sacks to overfill potatoes) was used as unit of measurement. This measurement exposed the producers to unfair treatment and exploitation since there is no legal enforcement mechanisms in case of complaint.

4.8.3 Policy constraints

Policy related factors impacting on horticultural crops production and marketing in the eastern part of Ethiopia can be generally categorized into three: restrictive policy environment, absence of policy, and limited capacity to enforce policy. The most important ones are described as follow:

Restrictive policy environment: Eastern part of Ethiopia has got location advantage to easily access and benefit from Djibouti and Somalia markets for its horticultural products. Presence of facilities such as railway, asphalt road and Airline flight to Djibouti helped to tap this advantage. Djibouti served as destination for 74% of vegetables and fruit products exported from Ethiopia. Over 95% of these products were produced by small scale farmers in the eastern part of Ethiopia. According to the information from Dire Dawa Trade and Industry Office, export of horticultural products to Djibouti has shown an increasing trend over years whereby the export of vegetables and fruits increased from 7,719 ton in 1992 to 30,629 ton in the year 2007. Similarly, the revenue from the export increased from 3.14 million Birr in 1992 to 61.51 million Birr in 2007. This indicates the significant economic potential that the Ethiopia-Djibouti market route could offer especially for the small scale horticultural crops producers in the Easter part of the country.

However, the potential gain from this opportunity seems seriously undermined due to inhibiting policy agreement between the two countries. The bilateral agreement between the countries before 10 years has posed two critical challenges on horticultural marketing in the region: it has set maximum export volume for some products and fixed export prices for 19 horticultural crops. The fixed export prices are irresponsive to recent inflation phenomenon and are significantly below local retail prices and whole sales prices (Table 5, above). This bilateral agreement takes critical departure from Ethiopia's market led development direction and served as disincentive to small producers in the eastern part of the country. Beyond, the country is also losing significant proportion of export earnings badly needed to expand local socio-economic development and transformation.

Absence of policy instruments: This relates to lack of clearly defined policy framework that governs Ethio-Somalia market relationship. In the recent years, Ethio-Somalia route has become the major market outlet for vegetables and fruit products. The shift to this route mainly attributes to the inhibiting policy environment related to Ethio-Djibouti horticultural marketing. This study finding indicated that 94% of various vegetables marketed in kombolcha were exported to different parts of Somalia in 2007. The share of volume of export through this route exceeds the quantity exported to Djibouti by nearly 13% during the same period. Unlike the Ethio-Djibouti route, the government of Ethiopia does not have policy framework that governs market relation between the two countries. Few exporters, usually Somalians residing in Kombolcha town, have monopolized the export to Somalia. These exporters buy the products at prices almost close to farm gate prices and directly sell to end consumers. They fix selling prices and carryout all transactions in the local currency. The horticulture producers do not have the space to negotiate but sell at a predetermined price. As a result, the lion share of benefits goes to exporters than to the other agents in the value chain. Consumers in the end market also pay very high price to consume the product. For example, consumers in Bossoso town pay about 540% of the producers' price for potato. This shows lose-lose relationship between the local producers and end consumers on the one hand and win-lose relationship between the local traders and exporters. Furthermore, the country lost significant foreign currency earnings due to absence of regulatory framework.

Limited capacity to enforce existing policy instruments: This problem is related to quality standard assurance of inputs and outputs, demand and supply forecasting capacity as well as capacity of institutions to reinforce the existing rules and regulations in horticultural production and marketing. Ethiopian Quality Standard and Control Agency has established a clearly defined policy framework to ensure quality standard of inputs and outputs. The agency has been given the mandate to establish quality standards and ensure the implementation. However, at the lower level of the administrative structure, there is a serious limitation on the strategies and practices in terms of enforcement, regulation and control of qualities and procedures related to distribution, marketing and handling of inputs and outputs. Particularly, the relevant agencies lack experience and capacity to implement the policies and strategies at the grass roots level. In fact agencies like the Quality Standard and Control Authority of Ethiopia in Dire Dawa have stopped certifying outgoing fruit and vegetable exports to Djibouti (Emana and Gebremedhin, 2007). Thus, it has been indicated by some key informants that the Ethiopian vegetables imported by Djibouti are sold in open markets while vegetables of good quality imported from other countries are sold in the super markets of Djibouti at higher prices.

Similarly, there is no standard and norms governing the sorting and weighing of the various vegetables and fruit products exported to Somali. In some instances, *gonfa* (an extended volume of sacks to overfill potatoes), was used as unit of measurement. Even if the sack was a standard one, there are limitations and lack of honesty in taking the measurement from the traders' side. Farmers cannot complain since they are concerned with the risk of boycotting by traders to purchase the vegetables as a result of which the products may perish.

5. RECOMMENDATIONS

5.1 Improving the supply of vegetables

- i. Improve the existing production system. This can be done by introducing vegetable varieties that best fit into the pattern of crop calendar, the crop rotation and enable efficient utilization of the crop production cycles used by the farmers. It is highly recommended to expand the highly demanded Jarso/Kombolcha potato varieties which are said to have good export quality in terms of good taste and longer shelf-life.
- ii. Technologies that increase productivity such as irrigation are needed. Improving the irrigation use efficiency will create the capacity to expand production and increase the supply during high price seasons. Increasing fuel price also puts high pressure on the cost of using motor pumps for irrigation. It is essential to search for alternative energy sources such as wind and electric energy.
- iii. Improve the input supply system so that farmers receive the right type of production inputs, the quantity needed at the right time. Improving the system will protect farmers from buying adulterated and fraudulent products. Moreover, the high price of fertilizer is becoming a challenge for optimum application of fertilizer. Provision of credit to enhance the use of agricultural inputs is an immediate option.
- iv. Upgrade the knowledge, skill and experience of key actors like producers, cooperatives and unions' staff members, development agents, supervisors and subject matter specialists to increase production and productivity. Marketing principles, bargaining skills, business

planning, quality management and post harvest handling of horticultural products are some of the interventions needed.

- v. Undertake research to support producers and traders with post harvest storage technologies.

5.2 Improving marketing of vegetables

The following concrete recommendations can assist to improve the marketing system and enable fair and equitable distribution of the welfare generated from the vegetables value chain.

- i. Develop sense of partnership among all market actors along the value chain. Engaging in discussions with stakeholders on how to improve the system. The possibilities include organizing (voluntarily) traders and producers and establishing trustful and strong trade agreements between the two institutions. Past attempts to organize the traders and producers without establishing a linkage between the two resulted in rival relationships. Neither the traders nor the producers succeeded.
 - Traders in Kombolcha can form an association that operates on common marketing principles in dealing with the producers, consumers and exporters.
 - Farmers can be organized in such a way that the organization provides market information to its member farmers, assure quality of supplies, provide standards both in terms of product quality and measurement, etc. In so doing, all actors along the market chain will benefit. Cooperatives can also aim at providing products to consumer institutions.
 - International NGOs such as ActionAid can complete the value chain development in Somalia and Ethiopia. ActionAid Somaliland can also involve in organizing importers who have been acting individually with less formal contact with traders so that they can be formally linked along the value chain and benefit from quality and dependable supply of vegetables. This process may lead to formal trading system between the two countries and avoid the risk of sudden market collapse if the governments takes action against the current practices.
- ii. Improvement of the market information delivery system in this process is necessary. With a strong relationship between traders and producers, searching for market information and dissemination will be crucial. It may be necessary to establish a district level market information delivery system which will be jointly owned by the stakeholders; i.e, the traders, producers, consumers, NGOs and the government.
- iii. Value adding processes in the horticulture sector are at their lowest level. Improving the marketing functions; such as the packaging, storage and transportation system is necessary to bargain for higher prices.
- iv. The vegetables and fruits market structure in Djibouti and Somalia is not known. In order to fully understand the horticultural marketing system, undertaking a horticultural marketing study in the neighboring countries is essential.
- v. Interventions which will improve local demand for horticultural products are also necessary. In this regard, education on the nutritional value of vegetables, home economics and promoting consumption of horticultural products would help.

- vi. Build the capacity of local institutions, namely the district level market council, cooperatives and development agents in terms of marketing principles, business management and legal rights in a competitive marketing system.

5.3 Policy advocacy

The most pressing policy factors that had impact on horticulture marketing in the eastern Ethiopia have been discussed above. The following recommendations are suggested.

- i. The Government should review the restrictive policy framework regarding horticulture products exported to Djibouti. The existing policy, which was put in place before 10 years, has significantly undermined the income of small producers in the region and limited the effort to overcome poverty.
- ii. The Ethio-Somali vegetables marketing system is quasi formal where the products are shipped formally but without fulfilling the legal export system such as financial flow. The government should put in place policy framework regarding Ethio-Somali market.
- vii. The horticulture marketing system should be put right. Establish and enforce a legal system in the marketing management. Defining quality parameters, standards, grades and putting regulatory frameworks to enforce pricing based on standards is important. The "*gonfa*" measurement system should be replaced by scientific units such as weighting on a standard balance.
- viii. Legalize the functioning of brokers in such a way that they will be accountable for their practices and enforce true functioning of a competitive marketing system.

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