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Review on Value Chain Analysis Potato in Ethiopia

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Abstract
More than 80% of the Ethiopian population earns their livelihood from crop cultivation and livestock rearing activities. Crop production is a major contributor to Gross Domestic Product accounting for approximately 28% from the sub sectors of agriculture. Among the crops, coffee, pulses, oilseeds, potatoes, sugarcane, vegetables and cereals are principal crops grown in Ethiopia. As a result, potato is the most important vegetable in terms of both production and consumption in Ethiopia. The objective of this study is to review the major potato value chain actors and their roles, determinants of quantity of potato supplied to the market and factors affecting potato value addition at different stages of the value chain in Ethiopia. Finally, from the review literature almost all results the production of potato and the demand of potato increase from year to year.The major actors of potato value chain were channeled from producer to final consumers, such as input supplier, producers (farmer), wholesalers, retailers, small scale processor, and consumers. Although trading of potato is profitable across all samples and Potato is among the major vegetable export products. It is traded in both local market and export market outlets. Among the different literatures the following variables determine the supply of potato such as, distance to the market, Access of market information, price of produce, Access to extension service, size of land, yield, Access of credit and access of non-farm income. In addition to these the factor affecting value addition are not washing off soil from harvested potato, lack of packing material or baskets, as well as lack of transportation, storage, access of credit, access of extension services, small quantity to produce and distance to market. Most of the scholars are not address the value addition issue so this review tries to give recommendation for other researchers to conduct research on this issue. The review suggests that proper method of handling, information, transporting can keep quality and quantity of potato production. Therefore, it is recommended to assign efficient extension system, updating the producer's knowledge and skill with improved production, storing and marketing system that enables to increase benefits of producers.
Keywords: Potato, Value chain, production, value addition
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1. INTRODUCTION

1.1 BACKGROUND OF THE REVIEW

Agriculture is the most important sector in Ethiopia; it accounts for 46% of GDP, 80% of export value, and about 73% of employment. The sector still remains largely dominated by rain-fed subsistence farming by smallholders who cultivate an average land holding of less than a hectare. Although agriculture has a long history in the country economy, development of the sector has been hampered by a range of constrains which include land degradation, low technological inputs, weak institutions, and lack of appropriate and effective agricultural policies and strategies (Aklilu, 2015).

Vegetable production plays important role in creating new employment opportunities for poor farmers and improving the feeding habit of the people. Since the labor to land ratio of vegetable cultivation is high (require intensive cultivation), its production and marketing activity allows high productive employment (Bezabih and Hadera, 2007). So, increasing vegetable production and marketing thus contributes to increase the income of the rural economy and food security.

Vegetables are usually grown in two seasons, namely in the wet season (locally known as meher season) using rainfall with supplemental irrigation or under full irrigation during the dry season. Vegetables such as pumpkin, Ethiopian mustard, hot pepper, sweet potato, potato and some others are predominantly grown under rain-fed conditions. Irrigated farming is considered costly due to the intensive use and high cost of diesel fuel for pumping water, agro-chemicals and hired labour costs. Thus, choice of crop selected for irrigation is critical. (Emana, 2013).

Different types of vegetables are grown in Ethiopia with different intensities in terms of land and other input allocation, purpose of production, and marketability. Among which potato is the world top non-grain food commodity. Global production over the past two decades has expanded from 267 to 375 million tons, and market opportunities are emerging to respond to the potato as a popular source of affordable food for growing urban populations. A highly dependable food security crop, potato offers important advantages over major food grains. Potato produces more food per unit area than the other major food crop. It generates more employment in the farm economy than other crops and serves as a source of cash income for low-income farm households through access

to higher value markets along the potato value chain. Finally, yet importantly, potato is not prone to speculative commodities trading on global markets, instead, prices are more likely set by local supply and demand conditions (USAID, 2013).

Potato (Solanum tuberosum L.) contributes to world food security and has a critical role to play in developing nations facing hunger. It supplements or replaces grain-based diets where rice, wheat, or maize availability has lessened or price has become unaffordable (Camire ME, 2009).

Potato has been considered as a strategic crop by the Ethiopian government aiming at enhancing food security and economic benefits to the country (Belayneh, 2018).

Potato is the major source of income of smallholder farmers in major part of Ethiopia. Even if it is a source of income to those producers, the crop is cultivated once by smallholder farmers through rain-fed. According to (CSA 2016) the land covered under potato is 254,000 ha (including Meher and Belg seasons) with total production of 2.8 million Mt. From a total of 4732.9 hectares for potato cultivated area 845,408qt was produced from which 338,163.2qt was supplied to the market with an average price of 324 birr/qt in a year of 2015/16. Where as in the year 2016/17, from a total of 4975.3 hectares for potato cultivated area 676,804.7qt/qt was produced and only 270,721.88qt was supplied to the market an average price of 337 birr/qt. (Tilahune, 2018).

There are many problems that hinder the production and marketing of potato in the country. From these challenges lack of market information, low quality of inputs used, weak market linkage, unfair and fluctuated price, low bargaining power of producers are the main challenges that were identified by different scholars. Therefore the review address potato production, productivity and marketing for better understanding of the status of production and productivity of potato, the value chain actors in the marketing exchange of potato as well as determinant of potato supply and value addition of potato in Ethiopia.

1.2 Objective of the review

The general objective of this study is to review value chain analysis of potato in Ethiopia and specifically

- To Review the production and productivity of potato in Ethiopia
- To Review major potato value chain actors and their roles in Ethiopia
- To Review determinants of quantity of potato supplied to the market in Ethiopia
- To Review factors affecting potato value addition at different stages of the value chain.

2. REVIEW OF LITERATURES

2.1 Definition and theoretical Concepts

Production: In agricultural, a stage of production can be referred to as any operating stage capable of producing a saleable product serving as an input to the next stage in the chain or for final consumption or use. Typical value chain linkages include input supply, production, assembly, transport, storage, processing, wholesaling, retailing, and utilization, with exportation included as a major stage for products destined for international markets. A stage of production in a value chain performs a function that makes significant contribution to the effective operation of the value chain and in the process adds value (Anandajayasekeram and Berhanu, 2009).

Value chain: KIT *et al*. (2006) defined value chain as: “Specific type of supply chain where the actors actively seek to support each other so they can increase their efficiency and competitiveness. They invest time, effort and money, and build relationships with other actors to reach a common goal of satisfying consumer needs so they can increase their profits”. The value chain actors who actually transact a particular product as it moves through the value chain include input suppliers (e.g. seed suppliers), farmers, traders, processors, transporters, wholesalers, retailers and final consumers (Hellin and Meijer, 2006). A value chain is an alliance of enterprises collaborating vertically to achieve a more rewarding position in the market. The basic characteristic of a value chain is market-focused collaboration: different business enterprises work together to produce and market products and services in an effective and efficient manner (AFCA, 2004).

Value chain actor: The term value chain actor summarizes all individuals, enterprises and public agencies related to a value chain; in particular the enterprises performing the basic functions of a value chain, typical operators include farmers, small and medium enterprises, industrial companies, exporters, wholesalers and retailers and the providers of support services. Certain government agencies at the macro level can also be seen as value chain actors if they perform crucial functions in the business environment of the value chain in question (GTZ, 2007).

Value addition: Value addition refers to the act of adding value(s) to a product to create form, place, and time utility which increase the customer value offered by a product or service. It is an innovation that enhances or improves an existing product or introduces new products or new product uses (Fleming, 2005).

2.2 Production and productivity of potato in Ethiopia

2.2.1 Potato production in Ethiopia

Potato is an important crop grown for food and income in Ethiopia. The acreage and production of potato has increased over four folds since 1961. The current acreage under potato is 254,000 ha (including Meher and Belg

seasons) with total production of 2.8 million Mt. Nevertheless, the potato sub-sector is still underdeveloped in Ethiopia, and yields are very low, 8-11 t/ha, compared to a potential of up to 35-40 t/ha among smallholder yields. This substantial yield gap highlights a significant opportunity to increase productivity and total production of potato in Ethiopia(CSA 2016).

Potato is the fastest growing food crop in Sub-Saharan Africa and it is an important crop for food security in parts of Ethiopia by virtue of its ability to mature earlier than most other crops at time of critical food need (Haverkortet *et al,* 2012;Asresie *et al,* 2015).The potato sub-sector in Ethiopia is relatively undeveloped and is faced with low productivity, low prices offered for producers and infrastructure is relatively poor and there are limited opportunities for processing and value addition due to poor processing facilities (Bymolt,2014).The consumption of potato in the form of sauce is the most popular, now a days the consumption of chips is increasing due to increasing urbanization, tourism and change in household's income (Tesfaye et al., 2010).A constraint in potato value chain exists along the chain the main production constraints are related to the poor seed quality, disease and poor crop management capacity of the farmer. The majority of the growers use indigenous seeds and other major challenge is the poor organization along the potato supply chain. Farmers often sell their potatoes to the middleman without knowing the marketing prices (Haverkort *et al,* 2012).

Among African countries, Ethiopia has possibly the greatest potential for potato production. 70% of its arable land - mainly in highland areas above 1 500 m - is believed suitable for potato. Since the highlands are also home to almost 90 percent of Ethiopia's population, the potato could play a key role in ensuring national food security. Potato is still widely regarded as a secondary crop, and annual per capita consumption is estimated at just 5 kg (FAO,2007).

In Ethiopia several varieties of potato are grown by farmers some of which are local and others are improved varieties.About 20 varieties have been reported to be grown in different parts of Ethiopia(Gildemacher, *et al*., 2009).

According to CSA (2017) from a total area of 66,923.33 hectares covered by potato 9,214,031.85qt was produced with yield of 137.68qt/ha in Maher season. From these Oromia, Amhara, SNNP and Tigray region covers in production and yields of 4,448,886.23(123.88qt/ha), 2,797,902.49qt (153.85qt/ha), 1,816,761.1qt (155.26qt/ha) and 50,387.59qt (80.96qt/ha) respectively.

In Ethiopia potato is grown in four major areas: North-Western, Central, Southern and Benishangul-Gumuz regions. In North-West area, the average yield of the crop ranges from 14 to 15 ton per hectare. South and North Gonder, East Gojjam, West Gojjam and AgewAwi are the major potato production Zones (CSA, 2015).

In Ethiopia, potato is produced in two season's i.e. in 'belg' season (March- August) and in 'meher' season (September-February). However, most of the production takes place in 'meher' season. Therefore, the season from September to February (i.e. 'Meher' season) is considered as the main season for which most of the information regarding potato production is available.

According to (CSA, 2010), the total potato production by private peasant holdings for the year 2009/10 was 5,723,325 quintals with an average yield of 82 quintals per hectare. potato production is the highest of all other root crops cultivated in the country. In terms of area coverage as well, potato is the largest of all root crops with a total area of 69,784 hectares.

Ethiopia is potentially conducive for potato production due to its favorable weather conditions and good strategic location (CoQA, 2009). However, although the country is endowed with huge arable land that can be allotted to potato cultivation, the current area cropped with potato is very small and yield is quite low (Hirpa *et al.,* 2010). There has been efforts made by the government to improve productivity and market performance of potato but the results are not that much promising. This can be attributed to many factors like inadequate technical and managerial production skills, poor contract enforcement (weak institutional framework), imperfections in the marketing chain and very few market related institutions and weak infrastructure (CoQA, 2009).

Potato plays a significant role in the country's economy. It is a crop with the highest volume of production among all other root crops and it also covers the largest area allotted to root crops in the country. In Ethiopia, potato is produced by both private peasant holdings and commercial farms. Though the total production by peasant holdings is much greater than that of commercial farms, the yield in commercial farms is greater than the yield in private peasant holdings. This better yield among commercial farms might be attributed to higher level of input use like fertilizer by commercial farms as compared to private peasant holdings. (Bekele, 2017).

potato production sector was constrained by different production and marketing problems like diseases, drought, insects(pests)problems, lack of sufficient irrigation water, limited access to supply of agricultural inputs, lack of adequate extension services, poor linkage with value chain actors, loss of produce, low produce quality and price fluctuation. Ware potato value chain was affected by several problems at each stage of the main value chain functions those influenced the efficiency and competitiveness of the whole chain in Ethiopia (Biruk-K, *et al* 2017).

2.2.2 Determinants of quantity of potato supplied to the market in Ethiopia

Different articles were reviewed in relation to determinants of market supply for agricultural commodities specifically potato product. The main purpose of this section is to identify the factors that affect market supply of

agricultural products and the method they used to quantify the cause and effect relationship between variables. According to Tilahun (2018) Estimates of the parameters of the variables expected to determine the marketable supply of potato by using multiple linear regressions. Among the hypothesized 12 variables in his result 5 variables were found to significantly influence on the market supply of potato. Among this only distance to nearest market affect negatively while use of improved seed, frequency of extension contact, land allocated for potato production and yield affect significantly and positively.

In relation to the above evidences Addisu (2016) conducted value chain analysis of vegetables: the case of ejere district, west shoa zone, Oromia national regional state of Ethiopia. In his study he examined determinants of volume of sales of potato using two stages least square (2SLS) method**.** The result of the model indicated that among hypothesized ten explanatory variables five variables productivity, sex of households, distance from nearest market, access of off/non-farm income and land allocated for potato significantly and positively influence volume sales of potato.

According to Bazie (2018) studyon value chain analysis of potato in awe zone 13 explanatory variables were hypothesized as factors affecting household level marketed surplus of potato. The hypothesized variables were family size, education level of household head, farm experience of the household head, frequency of extension contact, credit access, irrigation access, land size allocated for potato production, distance to all-weather roads, distance to the nearest market, TLU, lagged price, non/off farm income and cash income from other farm activities. From this variable, the result of the multiple linear regression models indicates marketed surplus of potato was significantly affected by distance to all weather roads, number of livestock, potato land size, irrigation access, cash income from other farm activities and lagged price. All of these variables affect marketed surplus positively except distance to all-weather road.

In addition to these Abraham (2013) using multiple regression model indicated that marketable supply is significantly affected by access to market information and quantity of tomato produced in the case of tomato; access to extension service, access to market information, vegetable farming experience and quantity of potato produced in the case of potato; and non/off-farm activities, distance to the nearest market and quantity of cabbage produced in the case of cabbage. The result shows that quantity of potato production significantly affected by access to extension service, access to market information, vegetable farming experience, sex of the household head, age of the household head and quantity of fertilizer application. Therefore, these variables require special attention if marketable supply is to be increased.

2.2.3 Marketing of potato in Ethiopia

Potato is among the major vegetable export products (EEI, 2015). It is traded in local market and export market outlets largely to Djibouti, which is an essential activity of the farming households where it generates income and have contributed to the development of potato sector (Tekalign, 2010). For instance, increasing of export of potato to Somaliland and Djibouti is major motive for potato farmers in Eastern Ethiopia (Bezabih and Hadera, 2007).

Around 80 to 90% of the total volume and value of potato exported to Djibouti. The second biggest export country is Somalia, which accounts for 8 and 15%. The remainder of the export is to Sudan, Yemen and Saudi Arabia. The export of ware potato, both in quantity/volume and value is increasing. E.g. the volume in 2001 was approximately 6,000 tonnes in 2010 this had reached 21.555 and 71,893 tonnes in 2015. The bulk of the potato products exported by Ethiopia are fresh or chilled potatoes, followed by frozen potatoes and a relatively small portion of seed potato. As indicated in the table below the export showed similar increasing trend in general in the last four years.

Potato, which is available for home consumption is found in different forms throughout the country. Fresh and processed potato are found in graded, washed, sorted, packed, branded forms. Frozen crisps (locally made, imported from whole potato or reconstituted) in supermarkets; boiled or fried potato at home; chips at restaurants are found in the urban areas of Ethiopia (Zhang et al., 2012). The demand of chips is increasing in urban part of the country (CIP, 2008).

Urquieta (2009) further identified that distance from the farm to nearest paved road, access to information through use of cell phone, age of household head and quantity of potato produced has a significant effect on potato market channel choices.

2.3 Major potato value chain actors and their roles in Ethiopia

Value Chain Analysis

The value chain map highlighted the involvement of diverse actors who are participated directly or indirectly in the value chain.

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, and government, NGOs, cooperatives, researchers and extension agents. According to Bazie(2016) and Tilahun (2018) the following are major actors of potato value chain in Ethiopia.

Input Suppliers

This is the first stage of potato value chain, many participants involved in this activity. Primary multipurpose farmers' cooperatives, seed suppliers (traders), NGOs and private agricultural chemicals suppliers are the main actors in supplying inputs to farmers. Potato farmers also participated in this stage in preparing their own inputs and they also supply input to fellow farmers. In combination, these actors supplied seeds, fertilizers (both DAP and Urea), chemicals and farm implements.

In Ethiopia, farmers use organic fertilizer (manure and compost) prepared by farmers themselves like compost and inorganic fertilizers supplied from cooperatives. According to Bazie result 54.17% used DAP fertilizer, 26.67% used Urea fertilizer, 52.5% used animal manure and 80.83% used compost. About 15% of farmers used chemical for controlling late blight and fungal diseases. Chemicals are supplied by private farm chemical suppliers found mainly in urban market (town). Farmers use different local farm tools for digging and traction by purchasing from local markets.

Producers

Potato producers in most part of Ethiopia are smallholder farmers who perform activities right from farm inputs preparation on their farms or procurement of the inputs from other sources to marketing of their product. The main value chain activities that potato farmers perform include land preparation/ ploughing, seeding and fertilizer application, irrigating, weed management/ digging, ridging,pest/disease controlling, harvesting, post-harvest handling and finally marketing. The average own land holding of producers in the area is 1.37 ha. The average land allocated to potato production by farmers in the production year was 0.30 ha with a maximum of 1 ha and minimum of 0.04 ha. The average quantity of potato produced per household by sample farmers was 32.72 Qt and the average potato yield in the production year was 114.47 Qt/ha and this finding is lower than national average estimate of 136.85 Qt/ha as reported in CSA (2015). The reason for low yield is mainly the prevalence of diseases and insects in the area.

Collectors

Collectors are found in village markets, most have trade license on vegetables and fruits. During peak harvest seasons February to end of June they assemble potato from farmers either at farm gate or from nearest market at their storage house for the purpose of reselling to wholesalers that found in the same kebeles or wholesalers from other area and those who come from other places and also to retailers at urban market. They also retail seed potato (supply input) to farmers October to end of January. These collectors communicate with wholesalers and asses the demand for the product before going to purchase. They do not store the collected potato for more than 3 days because of the fear of loss due to product Perishebility. Some collectors receive in advance payment from wholesalers and assemble the product.

Wholesalers

Wholesalers are mainly involved in purchasing potato from collectors and producers in larger volume than any other actors and supply either to other wholesalers, retailers and consumers. There are wholesalers who are found in rural markets and urban markets purchase potato produced in the district. Wholesalers in the local village markets are closely working with local collectors to buy potato collected in bulk and sell it to other wholesalers in other cities. They also purchase from farmers by going to their farms or from nearest market. Wholesalers at local market sell potato through cell phone communication with traders in different cities in the country.

Retailers

Retailers are the key actors in potato value chain in the district, the last link of potato value chain between consumers and wholesalers. According to Bazie ,(2016) there are considerable number of retailers who trade potato with other vegetables like tomato, cabbage, onions, peppers and other vegetables. Retailers purchased 55.39% of the total volume from wholesalers, 42.73% from producers and 1.88% from collectors for reselling to consumers (including individual household, hotels, restaurants and road vendors.

Consumers

Consumers are those purchasing the products for consumption. Potato consumers are individual households, institutions, hotels, café and restaurants. Potato is consumed in both rural and urban areas. They purchased from retailers based on the quantity desirable for them. They also purchase from producers and wholesalers. Consumers purchased about 65.94%, 31.87% and 2.18% of the total quantity of potato from retailers, farmers and wholesalers in that order.

The consumer that is individual households spent from 40- 300 birr per month for purchase of potato for household food consumption. These individuals prefer potato based on potato free from damage, color, size and tastes. For "key wot", red and medium sized potato is preferable. If it is consumed as boiled and/or Alecha, consumers prefer white and large size potato. It is also consumed in different forms, mixed with other food stuffs and meat. Consuming potato by mixing with cabbage is commonly done by interviewed households. Almost all of the potato consumers eat potato in the form of wot. Consumers mentioned problems in potato consumption about 74.29% of potato consumers reported that the main problem for potato is irregular supply of the product to the market. This is related to seasonality of production and product perishability. Sample respondents indicated

Perishebility (51.43%), limited dish (51.43%), poor product quality (62.86%) and relatively costly in off season period (51.43%) as the major problems in potato consumption.

2.4 Factors affecting potato value addition at different stages of the value chain

Value addition refers to the act of adding value(s) to a product to create form, place, and time utility which increase the customer value offered by a product or service. It is an innovation that enhances or improves an existing product or introduces new products or new product uses (Fleming, 2005).

Punjabi (2007) observed that it has become clear worldwide that the most rapid growth in agriculture has been occurring on the part of post-production activities. This is being driven by growth of middle-income consumers even in low income countries and their demands for better-quality value-added products. Absence of agro-industry and agribusiness resulting in low levels of value addition of agricultural commodities has been one of the main causes of stagnation in rural incomes. A substantial agribusiness sector generating a high outflow of value-added commodities is always correlated with high agricultural GDP and high rural incomes.

As potato is an important food and cash crop in Ethiopia, in particular in certain geographical areas like Amhara region, processing could bring more value addition. At the same time, it could, to a certain extent, reduce post-harvest losses. Another added advantage is that increasing the type and volume of outlets may give better prices for the farmers, in particular at harvest time. Various surveys demonstrate that with tendencies like feed habits changing in favour of easy-to-prepared foods such as French fries. And with the population doubling every 25 years and, there is a good potential for the establishment of processing industries and also increasing market outlets for both fresh and frozen potato chips. More so, in Ethiopia the prices of imported French fries are higher than locally made French fries by over 200 percent, which also indicates that there may be good opportunities for import substitution. Consumption of potato chips seems to be on the increase in Ethiopia at household as well as at retail outlets such as hotels, restaurants and supermarkets. Many of the retail outlets process French fries for own use or for selling in their own establishment (Agro-BIG 2016).

In Ethiopia value addition to potato at the farm and market level is limited to one or more of washing off soil from harvested potato, packing potato in gunny bags or baskets. Weighing using either a locally accepted container or weighing scale, storage of produce in a specialized building structure or in a farmer's house, transportation to the market either using , head loads or garie and sorting the potato into good and poor quality and grading it are the other value addition activities. (Harriet *et al*, 2018)

Inadequate finance was ranked 1st as a major constraint confronting potato farmers. This constraint greatly limits the potato production to a small-scale level, thus impede the value addition of potato. Low knowledge on potato value addition ranked as 2nd major constraint to potato value addition. Too much focus/attention on other roots and tuber crops, high cost of potato processing equipment, and bulkiness and perishable nature of potato were also major constraints to potato value addition. Similarly, respondents identified inadequate extension service support a challenge to the potato production and value addition (A. M. Omoare, et al, 2014).

3. CONCLUSION AND RECOMMENDATION

3.1 Conclusion

This seminar was review conducted in Ethiopia. The main focus of this seminar was to review value chains analysis of potato in Ethiopia. The value chain of potato in Ethiopia was not developed due to lack of market and low-value addition to the product. Therefore specifically the seminar was to review production and productivity of potato in Ethiopia; factors of potato value addition in Ethiopia and major value chain actors of potato and their role. Over the past two decades, both potato production and consumption have shown increasing trends in Ethiopia but still below the production potential of the country. In Ethiopia several varieties of potato are grown by farmers some of which are local and others are improved varieties. About 20 varieties have been reported to be grown in different parts of Ethiopia. Although Potato producers in most part of Ethiopia are smallholder farmers who perform activities right from farm inputs preparation on their farms or procurement of the inputs from other sources to marketing of their product. The major factors that affect the supply of potato to the market that most result indicates are distance to the market, market information, and price of produce, size of land, yield and access of non-farm income. Potato is among the major vegetable export products. It is traded in local market and export market outlets. This seminar also reviews the main value chain actors through whom potato were channeled from producer to final consumers, such as input supplier, producers (farmer), wholesalers, retailers, small scale processor, and consumers. In Ethiopia value addition to potato at the farm and market level is limited to one or more of washing off soil from harvested potato, packing potato in gunny bags or baskets, transportation, storage and also quantity to produce, distance to market, access of credit and access of extension services are the major determinant of value addition decision.

3.2 Recommendations

Recommendations (policy implications) those are relevant to improve potato value chain system in Ethiopia which

are indicate production and market orientation were set based on the significant variables and raised problems by the market chain actors.

Quantity of potato produced is one of the determinant factors that affect volume of potato supplied to the market positively. Therefore, policy proposed should focus on increasing production and productivity of the sector by identifying new technologies and management systems that would improve the production and productivity of the potato. Creating stable demand for surplus production would also enhance farmers' decision on potato production consistently.

To improve the production and productivity of potato in Ethiopia resolving the prevailing production problems deems a necessary condition. Among these increasing farmers' awareness on the importance of integrated crop management packages for increased productivity and sustainable production is one of them by supporting DAs by giving continuous capacity building trainings.

In addition, there is a need to enhance value addition activities to improve the quality like that of wheat and pepper in order to fetch higher price.

Market information dissemination is an important issue for value chain actors to help them decide on marketing their products. So, it is important to disseminate market information to all the potato value chain actors throughout the year.

The result of this review suggests that proper method of handling, information, transporting can keep quality and quantity of potato production. Therefore, it is recommended to assign efficient extension system, updating the producer's knowledge and skill with improved production, storing and marketing system that enables to increase benefits of producers.

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Table 1.quantity of potato produced in 2014-2017year

Quantity of potato produced in tonne	year
921,403.00	2017
1,039,740.00	2016
921,832.00	2015
784,993.00	2014

Source: Agriculture statistics Ethiopia in 2014-2017

Table 2.Quantity of potato that export in 2012-2015

Quantity of export in tonne	Year of export
71,894	2015
73,706	2014
66,174	2013
56,849	2012

Source: Ethiopian Revenue and Customs Authority (ERCA)

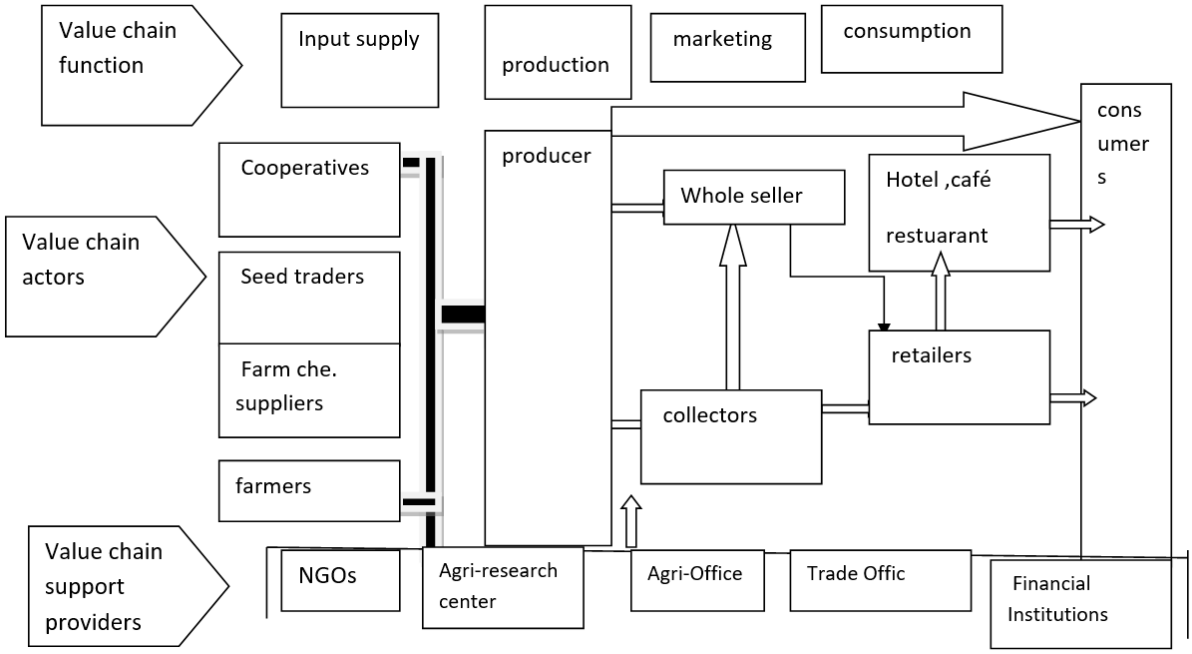

Figure 1 value chain map of potato