Potato Value Chain Analysis in the case of Dugda Woreda, East shoazone, Oromia national regional state of Ethiopia

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CERTIFICATE

This is to certify that the thesis entitles "*potato value chain Analysis in the case of Dugda Woreda, East shoa zone, Oromia national regional state of Ethiopia,* submitted to Addis Ababa University school of commerce for the award of Master of Arts in Logistics and Supply Chain Management and is a record of bona fide research work carried out by Mr.KabetoTadele, under my guidance and supervision.

Therefore, I hereby declare that no part of this thesis have been submitted to any other university or institutions for the award of any degree or diploma.

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DECLARATION

I hereby declare that this thesis entitled "*potato value chain Analysis in the case of Dugda Woreda, East shoa zone, Oromia national regional state of Ethiopia,* has been carried out by me under the guidance and supervision of Birhanu Danu (PHD).

The thesis is original and has not been submitted for the award of any degree or diploma to any university or institutions.

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ABSTRACT

Potato is important for its contribution to food security and as source of cash income for a large proportion of the rural households. However, enhancing potato farmers to reach markets and actively engage in the potato value chain is a key issue needed in the study area. This paper was aimed to identify value chains and their performance, factors affecting marketed surplus and farmers' choice of market channels using survey data collected from randomly selected 118 farmers and from purposively selected 42 traders and 35 consumers. Descriptive analysis was used for characterizing farmers, describing value chain and examining market performance. Input suppliers, farmers, collectors, wholesalers, retailers and consumers were main value chain actors and governmental offices and NGOs were support service providers of potato value chain in the study area. The chain is governed mainly by wholesalers with the assistance of brokers. Producers are price takers and hardly negotiate the price due to fear of post-harvest loss, in case the product is not sold. District retailers and wholesalers were received the highest remuneration from potato marketed in the study area while central retailers and rural collectors took the smallest profits shares from potato value chain. Five market channels are identified for potato in the study area. Total gross marketing margin (TGMM) is highest in channel II and IV which was 53.78% and 53.5%, respectively and lowest in channel III which was 34.24%. Producer's share (GMMp) was highest in channel III which account 65.76% from the total consumers" price and lowest in channel-II and IV which is 46.22% and 46.5, respectively. The cost led pricing approach dictates that the maximum retail price of potato from farmer to consumer in the addis abeba market should be 888.21 through potato supply chain; even though the current actual retail price of potato is higher than MRP which is 950 birr per quintal. On the other hand from the consumer's point of what potato finally worth to them, the potato value chain analysis at addis abeba market revealed a maximum retail price of 600 birr per quintal on average, which is less than potato supply chain analysis of 888.21.Variables like quantity produced, value addition, distance to market, distance to roads, non/off farm income, current price, potato market experience, sex of the household head, family size, and total livestock number (TLU) affected significantly farmer's market channel choice decisions. Therefore, these variables require special attention to increase farmer's margin from potato production and marketing so special focus need to be on these variables.

***Keywords**: Potato, Value chain, marketed surplus, channel choices, market cost and margins of the actors in the chain.*

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ACRONYMS AND ABBREVIATIONS

BoA Bureau of Agriculture

EIA Ethiopia Investment Agency

GMMCR Gross Marketing Margin of Central Retailers

GMMP Gross Market Margin of Producers

GMMRC Gross Marketing Margin of Rural Collectors

GMMW Gross Marketing Margin of Wholesalers

GoE Government of Ethiopia

GTZ German Technical Cooperation

GVC Global Value Chain

M4P Making Markets Work for the Poor

CIP International Potato Improvement Center

CSA Central Statistical Agency of Ethiopia

FAO Food and Agriculture Organization of the United Nations

GIZ German Society for International Cooperation

GTZ German Technical Cooperation

NGOs Non-Governmental Organizations

SNNPR Southern Nations Nationalities and Peoples' Region

Introduction

1.1 Background of the study

Fierce competition in today's global markets, the introduction of products with short life cycles, and the heightened expectations of customers have forced business enterprises to invest in, and focus attention on their value chain. This, together with continuing advances in communications and transportation technologies, such as mobile communication and overnight delivery, has motivated the continuous evolution of the value chain, and techniques to manage it (*Terry P. Harrison, Hau L. Lee, John J. Neale, 2004*).Potato is the fourth most important world food crop after wheat, rice, and maize (Joshi and Gurung, 2009). It is the fastest growing food crop in Sub Saharan Africa with the total production in some countries more than doubled during the last 15 years. This is similar to the development in Asia (China and India) where area and yield increased strongly (CIP, 2008).

Ethiopia has diverse climate and altitude conditions which are conducive to various agricultural activities. There are several lakes and perennial rivers that have great potentials for irrigated agriculture. The groundwater potential of the country is about 2.6 billion cubic meters. Groundwater in the country is generally of good quality and it is frequently used to supply homes and farmsteads. The potentially irrigable land area of the country is estimated at 10 million hectares, out of which only about 1% is currently under irrigation. Most of the soil types in fruits and vegetables producing regions of the country range from light clay to loam and are well suited for horticultural production (EIA, 2012). Vegetable production is becoming an increasingly important activity in the agricultural sector of the country following the development of irrigation and increased emphases given by the government to small scale commercial farmers. Recently, due to their high nutritional value vegetable do have ever rising demand both in local and foreign markets, and are classified among those export commodities‟ that generate considerable amount of foreign currency earnings to the country. As a matter of these facts commercial farms in Ethiopia used to grow vegetables over a considerable land area for years (CSA, 2015).

Potato was introduced to Ethiopia in 1859 by a German scientist called Schimper (Pankrust, 1964). Since then it was limited to homestead as a garden crop and gradual rise in production occurred at the end of 20th century, when there was a long famine in Ethiopia (Gebremedhin*et al*., 2008). It is the best staple food crop during this period as well as an important source of cash income (Gebremedhin*et al.*, 2013), because of its ability to provide a high yield of high-quality product per unit of input with a shorter crop cycle than major cereal crops like maize (Adane*et al*., 2010). Potato has been considered as a strategic crop by the Ethiopian government aiming at

enhancing food security and economic benefits to the country (EIA, 2012). As the population grows rapidly, increased productivity of potatoes can improve the livelihood of smallholder potato producers and is required to meet the growing demand (Gildemacher, 2012).

Potato provides an opportunity for domestic value chain development. Potato value chains cover all activities from input supply, production, processing, wholesale and retailing to the final consumer (Haggblade*et al*., 2012). The value chain exists within a wider operating environment which is defined by social customs and practices together with governmental legal and regulatory frameworks. Lack of availability of quality approved seed, poor farm practices, lack of storage for ware potato and limited capacity of cooperatives are the barriers to an effective value chain at present time (VITA, n.d). Potato provides huge opportunity and there are good prospects for value addition, this opens wider room for commercial investment in key value chains (AGRIBiz, 2015).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 potatoes 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 potato chips is increasing in urban areas of the country (CIP, 2008).

1.2. Statement of the Problem

Ethiopia has a comparative advantage in a number of horticultural commodities due to its favourable climate, proximity to European and Middle Eastern markets and cheap labour. However, the production of horticultural crops is much less developed than the production of food grains in the country. Out of the total land area under cultivation in the country, land under fruits and vegetables is insignificant as compared to food crops (EIA, 2012).

Farmers produce potato for household food consumption and as source of cash income. However, there are problems related to potato in the country in general and in the study area in particular; Input supply shortage, low productivity, product perishability, poor post-harvest management, price drop after harvest, limited recipes at consumption level (Bezabih and Mengistu, 2011; kassa, 2014; Yazie*et al.*, 2009), limited infrastructural development, transportation problem and low negotiation power of producers who can be cheated by marketing agents.

According to Kumilachew*et al*. (2014) risks in vegetable production from the perspective of smallholder farmers‟ results suggest that production and price risks

were generally perceived as the most important sources of risks. Of all the risk sources, output price fluctuation, drought, pests/diseases, termites/insect attack, high costs of inputs, flood/high rainfall, illness/injury/death of operator/member, changes in family relations, theft, conflict and violence, changes in policy and rules, and high cost of credit were of important concerns in that order of importance. Market risks may be due to factors affecting the timely delivery of produce to markets or quality of produce (e.g. poor feeder roads, non-existence of storage/transportation facilities, bulk and perishable nature of the produce). Consequently, farmers are forced to sell their produce to the traders at cheaper prices. The steep fall in market prices during the harvest season has been the most common grievance of farmers.

In a properly functioning market, marketing outlets have to guarantee that consumers can buy and that producers can sell their products at reasonable prices in the market place. Although, such opportunities stand to generate additional income to smallholder farmers, they still remain under exploited among most of the potato farmers in the study area.

The development and upgrading of the value chains is an important agenda for the government, companies and other institutions. Entry into higher value markets requires an understanding of the requirements and dynamic forces within the value chain (Baker, 2006). Understanding of the existing inputs supply systems, production, marketing systems and consumption of potato is important for developing/upgrading value chain in the study area.

In order to motivate potato farmers to produce and supply more to the market, potato value chain must operate well. The study on factors affecting potato marketed surplus, market channel choice of farmers and the benefit share of different actors in the value chain were not done and literature on market channel choices is thin in the country. So, this study was proposed to investigate the value chain analysis of potato produced in dugda district, east shoa zone of oromia region. In doing so, the study attempted to contribute in filling the knowledge gap by assessing potato value chain and its performance, factors affecting potato marketed surplus and market channel choices in the study area for the purpose of providing vital information for effective research, planning and policy formulation and for better intervention by government and other stockholders.

1.3. Research questions

The study was intended to answer the following research questions:

1. What does potato value chain map look like in the study area?
2. Who are potato value chain actors and what are their roles?
3. What are actors' costs and profit margin in potato value chain?
4. What factors affect market supply of potato at farmers' level in the district?
5. What are the alternative potato market channels and the factors affecting farmers' potato market channel choice decisions?

1.4. Objectives of the Study

The general objective of the study is to analyze the value chain of potato in the study area. The specific objectives of the study are:

1. To map potato value chain, in the study area
2. To identify actors, their roles and linkages in the study area
3. To quantify actors costs and profit margin in potato value chain
4. To identify the determinants of quantity of potato supplied to market by farmers; and
5. To identify determinants of market channel choice decisions of potato producer farmers.

1.5. Significance of the Study

Improved access to market outlets and value chain approach, among other factors are believed to contribute to the success of potato value chain. Value chain analysis provides an overview and a good understanding of the specific economic reality, potato sector in this case. The result of this study will help public agencies and development projects for implementing chain promotion, planning, supportive actions, formulating impact indicators and monitoring value chain projects; private enterprises may use to set out a vision and upgrading strategy for themselves and the value at large; the mapping of market channels and economic analysis result will help the value chain actors to improve their performance. Therefore, the result of this study will serve as an important input to market research. Universities, research centres, extension workers, community based organizations, nongovernmental organizations, government ministries and agencies and cooperatives can use findings from this study for intervention purposes and/or references. Consumers, traders, hotels/restaurants can benefit in such a way that its promotion can enable access to actor oriented products, improved hygiene and quality products.

1.6. Scope and Limitations of the Study

Due to time and financial constraints the study was conducted in *dugda* district of *east shoa* zone in oromia region, Ethiopia. The study will intend to investigate value chain analysis in potato commodity. It addresses mainly potato producer farmers in the district and other value chain actors found in the district and outside the district. The study will emphasize on analysing potato value chain specifically studies value chain mapping, the cost and profit margins of the actors, factors determining marketed surplus of potato and market channel choice of farmers.

1.7. Organization of the Study

The Thesis will be organized in five chapters. The first chapter will deals with the introductory part. The second chapter will presents review of literatures on value chains and related concepts. Chapter three will presents research methodology of the study (description of the study area, data types, sources and methods of data collection, sampling techniques and methods of data analysis). The fourth chapter deals with results and discussion of the findings. The final chapter will summarizes and concludes the finding of the study with recommendations and policy implications.

2. RELATED LITERATURE REVIEW

2.1. Basic Concepts and Definitions

2.1.1. Value chain: Value chain defined as the full range of activities that are required to bring a product (or a service) from conception, through the different phases of production, to delivery to the final consumer and disposal after final use (Kaplinsky and Morris, 2001). 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). On functional view, value chain can be defined as a sequence of related business activities (functions) from the provision of specific inputs for a particular product to primary production, transformation, marketing, and up to the final sale of the particular product to consumers (GTZ, 2007).

2.1.2. Supply chain: It is sequence of (decision making and execution) processes and (material, information and money) flow that aim to meet final customer requirements that take place within and between different stages along a continuum, from production to final consumption. The Supply chain not only includes the producer and its suppliers, but also, depending on the logistic flows, transporters, warehouses, retailers, and consumers themselves. In a broader sense, supply chains include also new product development, marketing, operations, distribution, and finance and customer service (FAO, 2007).

2.1.3. 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).

2.1.4 Value added: Value added is a measure for the value created in the economy. It is equivalent to the total value generated by the actors in the chain (chain revenue = final sales price * volume sold). The value added per unit of product is the difference between the price obtained by a value chain actor and the price that the actor has paid for the inputs delivered by actor of the preceding stage of the value chain. In short:

"The worth that is added to a good or service at each stage of its production or distribution" (Schmitz, 2005).

2.1.5 Marketing channel: Marketing channel is defined by different authors. Marketing channel is a set of marketing activities necessary to transfer the ownership of goods from the point of production to the point of consumption. The marketing channel can be viewed as large canal or pipeline through which products, their ownership, communication, financing and payment, and accompanying risk flow to the consumer (Backman and Davidson, 1962). Formally, a marketing channel is a business structure of interdependent organization that reaches from the point of product origin to consumer with purpose of moving products to their final consumption destination (Kotler and Armstrong, 2003). This channel may be short or long depending on kind and quality of the product marketed, available marketing services, and prevailing social and physical environment (Islam *et al*., 2001).

The value chain approach was developed by Michael Porter in the 1980s, and described in his book Competitive Advantage: Creating and Sustaining Superior Performance. His idea was to divide a business into its strategic activities to make them better than the rivals, or to a lower cost. A firm's value chain is affected by their suppliers‟ and customers‟ value chains since they are all parts of a value system (Porter, 1985). The concept of value added in the form of a value chain has been used to build up an industry's sustainable competitive advantage in the business field. The entire industry is formed of activities that link together to develop the value of the business, and together these activities form the industry's value chain. Such activities included product manufacturing, and activities of purchasing, distribution and marketing of the company's products (Lynch, 2003). Since the value chain framework is used as a powerful analytic tool for the strategic planning of an organization, it aims to maximize value creation while minimizing costs.

According to Barnes (2004) 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. Value chains allow businesses to respond to the market place by linking production, processing and marketing activities to market demands. Vertically aligned means that companies are connected from one end of the primary production process (e.g., farmer's field), through processing, and possibly into the final marketing stages where consumers purchase a finished product. While companies in a value chain are legally independent operations, they become interdependent because they have common goals and work collaboratively to achieve them. They work together over the

long term discussing issues and troubleshooting problems together. It's more than just long-term contracting.

2.2. Purpose of Value Chain Analysis

According to Kaplinsky and Morris (2002), there are three main sets of reasons why value chain analysis is important in this era of rapid globalization. The first reason they raised is that with the growing division of labour and the global dispersion of the production of components, systemic competitiveness has become increasingly important. Second, efficiency in production is only a necessary condition for successfully penetrating global markets. Third, entry into global markets which allows for sustained income growth requires an understanding of dynamic factors within the whole value chain.

Value chain analysis is conducted for a variety of purposes. The primary purpose of value chain analysis, however, is to understand the reasons for inefficiencies in the chain, and identify potential leverage points for improving the performance of the chain, using both qualitative and quantitative data. Value chain analysis facilitates an improved understanding of competitive challenges, helps in the identification of relationships and coordination mechanisms, and assists in understanding how chain actors deal with powers and who governs or influences the chain. The value chain framework seeks to overcome these constraints by identifying different entry-points and linkages that small and medium enterprises can leverage in a given production or supply chain (USAID, 2008).

2.3. Mapping a Value Chain

Mapping a value chain facilitates a clear understanding of the sequence of activities and the key actors and relationships involved in the value chain. This exercise is carried out in qualitative and quantitative terms through graphs presenting the various actors of the chain, their linkages and all operations of the chain from pre-production (supply of inputs) to industrial processing and marketing (UNIDO, 2009).

According to Kaplinsky and Morris (2000) mapping the chain means giving a visual representation of the connections between actors and tracing a product flow through an entire channel from the point of product concept to the point of consumption. It is an ideal tool for measuring and quantifying the cost of administrative distortions that hinder competitiveness of products and industries. In its simplest form, the value chain is merely a flow diagram. Value chain can be complex and contain a big number of actors. Each actor can also be connected to more than one value chain. Therefore it is important to know the aim of the study and the point of interest. Thereafter decision can be made on where in the chain to start and what to include in the chain analysis. The first step in a value chain study is to identify the actors and the

connections between them to get the chain mapped out. This can be done with a qualitative study, followed by a quantitative study when the map of the chain is completed. The quantitative study gives more information about activities and relations in the chain and makes the study more certain (Hellin and Meijer, 2006).

2.4. Market performance

Market performance can be evaluated by analysis of costs and margins of marketing agents in different channels. A commonly used measure of system performance is the marketing margin or price spread (Getachew, 2002). Performance of the market is reflection of the impact of structure and conduct on product price, costs and the volume and quality of output (Cramers and Jensen, 1982). Market performance can be evaluated by analysing costs and margins of marketing agents in different channels. A commonly used measure of system performance is the marketing margin or price spread. Margin or spread can be useful descriptive statistics if it used to show how the consumer's price is divided among participants at different levels of marketing system.

2.5. Marketing cost

It refers to those costs which are incurred to perform various marketing activities in the transportation of goods from producer to consumers. Marketing costs includes handling cost (packing and unpacking), costs of searching for a partner with whom to exchange, screening potential trading partners to ascertain their trustworthiness, bargaining with potential trading partners (officials) to reach an agreement, transferring the product, monitoring the agreement to see that its conditions are fulfilled, and enforcing the exchange agreement (Holloway and Ehui, 2002, cited in Ayelech, 2011). Marketing costs refers to those costs, which are incurred to perform various marketing activities in the shipment of goods from producers to consumers. Marketing cost includes: Handling cost (packing and unpacking, loading and unloading putting inshore and taken out again), transport cost, product loss (particularly for perishable fruits and vegetable), storage costs, processing cost and capital cost (interest on loan), market fees, commission and unofficial payments (Heltberg and Tarp, 2001).

2.6. Marketing margin

A marketing margin is the percentage of the final weighted average selling price taken by 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 product. In other words it is the difference between retail price and farm price (Cramers and Jensen, 1982). The marketing margin in an imperfect market is likely to be higher than that in a competitive market because of the expected abnormal profit. But marketing margins can also be high, even in competitive market due to high real market cost (Wolday, 1994). Marketing margin is a commonly used measure of the performance of a marketing system (Abbott and Makeham, 1981).

2.7. Value addition

Value addition is one aspect of marketing that deals with practices that change or transform a primary product into goods that have additional value. Values adding activities based on their simplicity and difficulties. The simplest are washing, cleaning, grading, bulking and storage; these activities are conducted by the control of farmers. And the complicated are ginning, roasting, refrigerating, milling, cutting, mixing, dehydration, cooking and packaging. These activities are generally undertaken by specialist market chain actors or service providers (Muluken, 2014). Value-added is used to characterize food products that are converted from a raw state through processing that gives the resulting products an incremental value in the market place. An incremental value is realized from either higher price or expanded market. Value-added is also used to characterize food products that gain incremental value in the marketplace through differentiation from similar products based on attributes such as geographical location, environmental stewardship, food safety or functionality (Stevenson and Pirog, 2013).

One of the central points or concepts in value chain analysis is the one of value added. In a broad sense, applicable not only to value chain analysis, but to any analytical work in the sphere of economic growth and development, the value added refers to the creation of wealth, the contribution of the particular production process, or particular chain, to the growth of the economy (FAO, 2006). Value addition is created at different stages and by different actors throughout the market chain. The addition of value may be related to quality of the product, costs of the product, delivery times, delivery flexibility, innovativeness, etc… of the chain members. The size of value addition is determined by the willingness of the end user to pay for the delivered products. The opportunities to add value by the company is depend on a number of

factors, such as market characteristics (size and diversity of markets) and technological capabilities of the actors (Kaplinsky and Morris, 2000).

2.7.1. Governance structure

Governance is a central concept to value chain analysis. Governance can be defined as non-market coordination of economic activity. The starting point for interest in global value chains is the fact that some firms directly or indirectly influence the organization of global production, logistics and marketing systems. Through the governance structures they create, they take decisions that have important consequences for the access of developing country firms to international markets and the range of activities these firms can undertake (Gereffi*et al*., 2001).

Governance is defined as how control is exercised with in the value chain actors and plays a major role in how production capabilities are upgraded; determine the sustainability of the value chain and distribution of an equal benefit among the value chain actors (Marshal and Schreckenberg, 2006).

2.8. Methodology for Value Chain Analysis

According to M4P (2008) four steps of value chain analysis are essential when applied to the agricultural/agro-industrial sector. For vegetables value chain analysis, those steps of value chain analysis were adopted:

1. **Mapping the value chain** to understand the characteristics of the chain actors and the relationships among them, including the study of all actors in the chain, of the flow of goods through the chain, of employment features, and of the destination and volumes of domestic and foreign sales. This information can be obtained by conducting surveys, interviews and participatory workshops as well as by collecting secondary data from various sources.

2. **Identifying the distribution of actors' benefits in the chain**. This involves analyzing the margins and profits within the chain and therefore determining who benefits from participating in the chain and who would need support to improve performance and gains. In the prevailing context of market liberalization, this step is particularly important, since the poor involved in value chain promotion projects are the most vulnerable.

3. **Defining upgrading needs within the chain**. By assessing profitability within the chain and identifying chain constraints, upgrading solutions can be defined. These may include interventions to: (i) improve product design and quality and move into more sophisticated product lines to gain higher value and/or diversify production; (ii) reorganize the production system or invest in new technology to upgrade the process and enhance chain efficiencies; (iii) introduce new functions in the chain to increase

the overall skill content of activities and (iv) adapt the knowledge gained in particular chain functions in order to redeploy it in other sectors.

4. **Emphasizing the governance role.** Within the concept of value chain, governance defines the structure of relationships and coordination mechanisms that exist among chain actors. By focusing on governance, the analysis identifies institutional actors that may require support to improve capabilities in the value chain, increase value added in the sector and correct distributional distortions. Thus, governance constitutes a key factor in defining how the upgrading objectives can be achieved.

According to GTZ (2007), value chain concepts, there are four levels; namely, micro, messo, macro and meta levels in which relevant survey topics for the analysis of a value chain are embedded.

At the micro level, value chain operators perform basic functions in the value chain be it as input suppliers, primary producers, processors or distributors (wholesalers, retailers, transporters, exporters).

At the messo level, one finds public and private service providers‟ e.g. regional associations, rural banks, agricultural government institutions, local civil society organizations.

At the macro level such as national, policymakers, regulatory bodies, federations of associations provide enabling framework conditions for businesses that may be pro-poor. This may relate to legislation, standards, infrastructure etc.

Finally, the meta level describes socio-cultural factors facilitating or hindering business linkages, business attitudes and trust among the value chain actors.

2.8.1. Mapping a Value Chain

Mapping a value chain facilitates a clear understanding of the sequence of activities and the key actors and relationships involved in the value chain. This exercise is carried out in qualitative and quantitative terms through graphs presenting the various actors of the chain, their linkages and all operations of the chain from pre-production (supply of inputs) to industrial processing and marketing (UNIDO, 2009).

According to Kaplinsky and Morris (2000) mapping the chain means giving a visual representation of the connections between actors and tracing a product flow through an entire channel from the point of product concept to the point of consumption. It is an ideal tool for measuring and quantifying the cost of administrative distortions that hinder competitiveness of products and industries. In its simplest form, the value chain is merely a flow diagram. Value chain can be complex and contain a big number of actors. Each actor can also be connected to more than one value chain. Therefore it is important to know the aim of the study and the point of interest. Thereafter decision can be made on where in the chain to start and what to include in

the chain analysis. The first step in a value chain study is to identify the actors and the connections between them to get the chain mapped out. This can be done with a qualitative study, followed by a quantitative study when the map of the chain is completed. The quantitative study gives more information about activities and relations in the chain and makes the study more certain (Hellin and Meijer, 2006).

2.9. Review of Empirical Studies

A number of studies employed the value chain approach to agricultural commodities. As described by Dolan *et al*. (1999), Horticulture Global Value Chain (GVC) has been dominated by large retailers that have adopted competitive strategies year round supply. A dramatic change in the marketing channels is seen which shifted from wholesale markets to tightly-knit supply chains. Production moved away from small-holders to large firms, many of which are owned by exporters. Within the horticulture GVC, producers who are also exporters directly deal with importers and importers, in turn, deal directly with retailers/supermarkets. Directly owned units firms are able to exert greater control over production processes and are better able to comply with quality, environmental and social standards.

Bezabih (2008) conducted a study on horticultural value chain in Eastern parts of Ethiopia identified constraints on the chain. The study identified the major marketing constraints such as huge number of middlemen in the marketing system, lack of markets to absorb the production, lack of marketing institutions safeguarding farmers' interest, low price for the products, rights over their marketable produces, imperfect pricing system, lack of coordination among producers to increase their bargaining power, lack of transparency in market information communications and poor product handling and packaging.

Almaz*et al*. (2014) used value chain approach to study on constraints of vegetables in Ethiopia in perspective of gender. The finding of study indicate that potato value chain is complicated by substantial problems including; low yield, lack of production and marketing skill, lack of capital, adulteration (poor quality of seed), lack of market information, brokers hindering fairness price, unable to have good vegetable marketing policy, problem of rural road access, storage problem, improper shading and lack of demand. The productivity level of potato in the study area is below its potential. Female-headed producers had low yield compared to their male counterparts. The study recommended giving due attention needed for vegetable marketing and production in any on-going and future vegetable development plan.

According to Bezabih and Mengistu (2011) production of potato is both for seed as well as consumption. The major potato value chain actors include input (seed,

fertilizer, fungicide, farm implement) suppliers, producers, wholesalers, brokers, retailers and consumers. The study also, stated that the potato value chain is constrained by shortage of improved and quality seed, low yield, low irrigation facility, poor disease control, less targeted to seed production, perishability, storage facility, low skill in post-harvest management, lack of storage facility, lack of processing facilities, low skill and technology for processing, brokers interference in the market and traders suppressing of potato price differences.

Vegetables value chain study conducted in Habro and KombolchaWoredas by Abraham (2013) identified different problems on the chain. The major constraints hindering the development of vegetable value chain are lack of modern input supply, high postharvest losses, the limited power of price setting, the problem of supply shortage, lack of storage facility, problem in information flow, low product quality, lack of support from concerned bodies, high monopolistic power of wholesalers, high travel distance of export to Somalia, lack of processing and long chain condition of the market. Pandey*et al*. (2013) conducted study on an economic study of marketed Surplus of chickpea in Rewa District of Madhya Pradesh using cross sectional data by adopted multiple linear regression. The studies came up with the finding that yield/ha, size of family, production of chickpea, size of holding and income from other sources variables are significantly affected on marketed surplus. In related studies, by Adenuga*et al*. (2013) on marketing efficiency and determinants of marketable surplus in vegetable production in Kwara state, Nigeria. This study indicated that the marketable surplus was found to be about (60%) of the total vegetable production. Household size, spoilage at farm level, education of the household head and farming experience were the significant determinants of marketable surplus in vegetable production in the study area.

According to Moti (2007) horticulture could be way out for agricultural commercialization of small-scale farmers with relatively better agricultural resource potential. If small-scale farm household have to move towards the production of horticultural crops for agricultural commercialization, factors influencing household decisions behaviour in resource use should be studied. It reported that diversifying the export base towards non-traditional agricultural commodities, as horticulture is important. He added linking small-scale farm household horticultural production with export could help both in reducing export earning instability and enhancing farm household's income.

2.10. Conceptual Framework

A value chain consists of all stages of a technical production process as well as of the interaction between these stages. The production process starts at the stage of input supply, than covers production, processing and marketing and ends with the consumption of a certain product. It can be seen as the hard skill of a value chain. The second part of a value chain, the interactions between the single stages, is the relationships and contractual linkages that not only determine the way the goods are traded between the different stages but are decisive for the overall character of the chain. The linkages between the stages lead to the so called governance structure of a chain that can be seen as the soft skill of it (Schipmann, 2006). The conceptual framework of potato value chain views as a network of horizontal and vertically integrated value chain actors that are jointly aimed toward providing products to a market. The value chain includes direct actors who are commercially involved in the chain (input suppliers, producers, traders, retailers, consumers) and indirect actors who provide services or support the functioning of value chain. These include financial or non-financial service providers such as bankers and credit agencies, business service providers, public research, transportation, extension agents and NGOs. Figure 1 below depicts the conceptual framework of the study which reflects possible order of analysis of potato value chain

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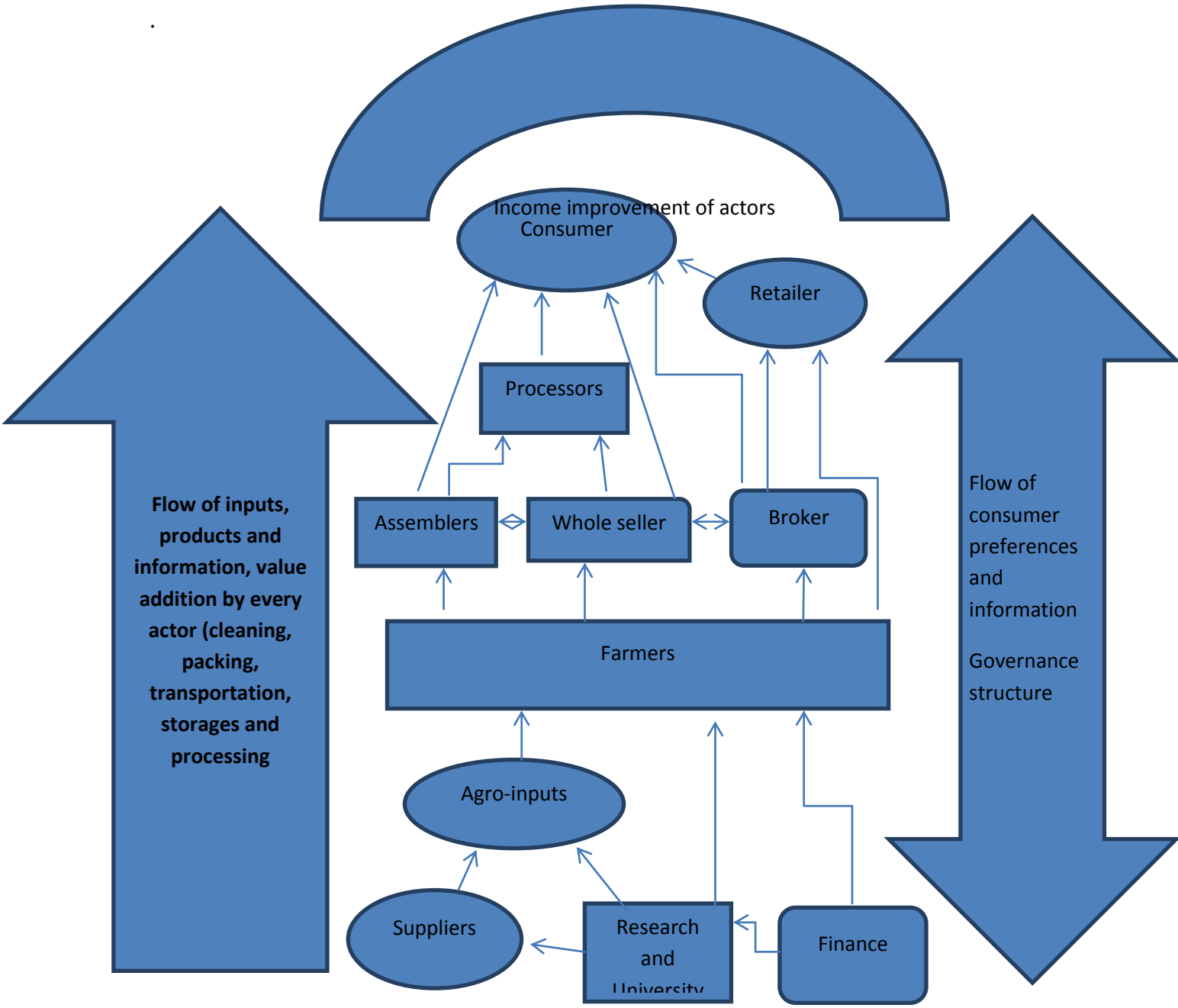


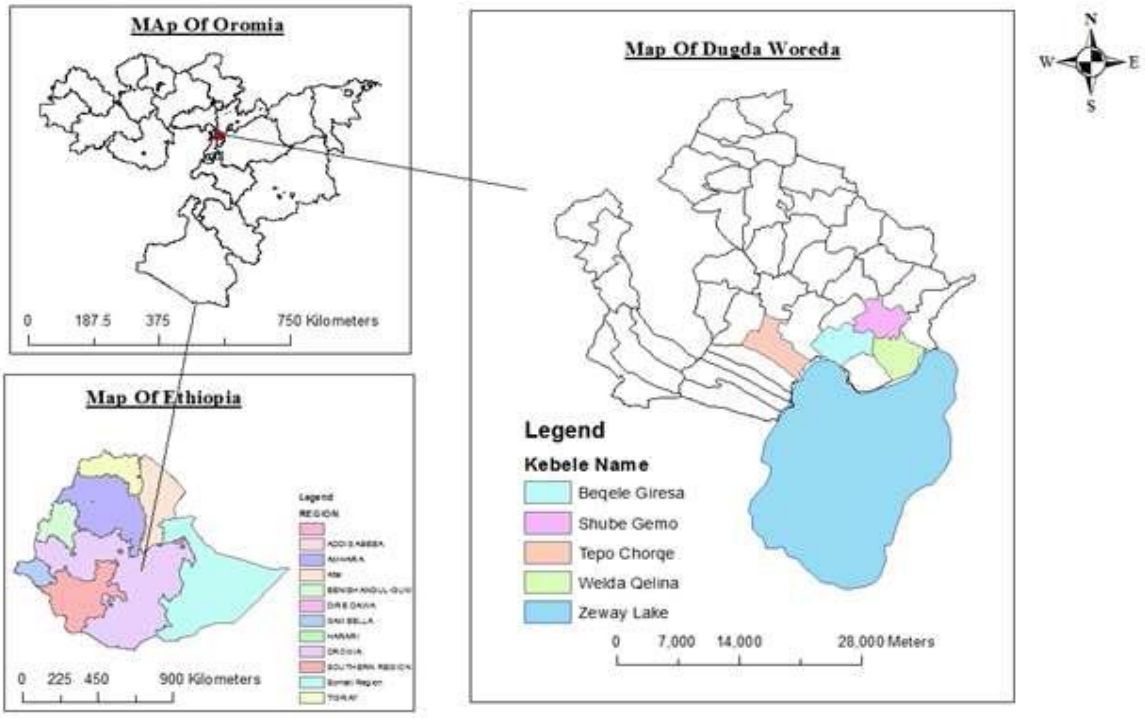
Figure 1. Potato value chain conceptual map

Source: Own sketching

3. METHDOLOGY

3.1. Description of study area

Geographically Dugda district is located in between 8º01’ N to 8°10’ N latitude and 38°31’ E to 38°57’E longitude. Dugda district is located in the East Shoa zone of Oromia Regional State that has a total area of 959.45 km2. Overall, the district has 36 rural Peasant Administrations and four urban villages. The main capital of the district is Meki town which is situated 134 km to the southeast of the capital Addis Ababa. Meki has 3 urban villages and has a population of 58,490. The boundaries of Dugda district are Arsi zone in the east, Gurage zone in the west, Bora district from north and northwest and Adami Tulu JidoKombolcha district in the south. According to Central Statistical Agency population projection for the year 2017, the population of Dugda district accounts 196,678 of whom 100,761 (51.2%) are men and 95,917 (48.8%) are women. From a total population of the district, 58,490 (29.7%) of its population are urban inhabitants and the remaining majority 138,188 (70.3%) of the population are rural dwellers. vegetables and root crops produced in the area include onions, potato, tomato, pepper, cabbage and sweet potato. Annual crops are predominant and rain-fed agriculture is mainly practiced using animal power. Livestock production is also another source of income and food source next to crop production. map of the study area is shown below.



Map of the study area (source, dawit h/giorgis, 2017)

3.2. Sources of Data and Method of Collection

Both primary and secondary data were used for this study. Secondary data sources include dugda wereda Irrigation and Development Authority, dugda Bureaus of Agriculture, District Trade and Market Development Office and its associated primary cooperatives and Central Statistical Authority (CSA), published and unpublished reports, bulletins, and websites. Both qualitative and quantitative data was collected and used for the study. The formal survey was under taken through interviews with selected potato producer farmers, traders and consumers using a pre-tested semi-structured questionnaire for each group. Key informants interview was conducted with input suppliers, producer, potato traders, district agricultural experts, marketing experts and end users. For this purpose, different guiding questionnaires were prepared and used. Furthermore, additional information from NGOs, agricultural, trade and other offices which are providing support services for potato value chain was collected by using checklist.

3.3. Sampling Techniques and Sample Size

The study area, dugda wereda, was selected as a study area since the area has high potential for potato production and marketing. Initially actors who involved in a value chain were identified using review of related literature and asking of some key informants from respective offices. Following this, samples were selected from each segment of the value chain included in this study using diverse sampling techniques.

For sampling producers, a stratified multi-stage sampling technique was implemented. The district has 33 rural *kebeles*, 10 of them produce potato. In the first stage, all potato producer *kebeles* in the district was selected purposively. In the second stage, from these potato producer *kebeles*, 4 sample *kebeles* ware selected randomly. In the third stage, the study considered only potato producer households. Thus, from each sampled *kebele* potato producer farmers was listed out with the help of development agents at *kebele* level. From these population lists, sample farmers were selected randomly based on probability proportional to size sampling technique. For this study the total sample size for sample household farmers was determined based on the sampling formula provided by Yamane (1967). The formula used for sample size determination with 95% confidence level, degree of variability = 0.5 and level of precision 9% (0.09) was:

$$n = \frac{N}{1+(e2)}$$

Where: n= Sample size, N= Population size and e= level of precision

Based on the above formula a total of 118 households will be interviewed.

Distribution of sample households in the district Sample *kebeles*	Number of potato producer households	Number of sample households
Weldakelina	979	42
Bekelegirisa	678	28
Shubigemo	624	25
Tepochoroke	593	23
Total	2874	118

Sample traders was taken at different stages of the value chain. Hence, a purposive sampling method was used to select wholesalers, rural collectors and retailers from the markets that potato passed through. Accordingly, a total of 42 traders was selected from Weldakelina, Bekelegirisa, ShubigemoTepochoroke,andkebele found in meki city.Sampling of consumers: to get information from potato consumers purposive sampling technique was employed and 35 respondents was selected from district rural markets and three kebeles found in meki city.

3.4. Methods of Data Analysis

Descriptive statistics were used to analyze the data collected from potato producers, traders at different levels and consumers.Appropriate statistical software such SPSS will be used to analyze the collected data.

3.4.1. Descriptive Statistics

In these methods of data analysis the study employed maps, graphs, percentages, frequencies, means and standard deviations with appropriate statistical tests in the process of examining and describing value chains, market performance and households' characteristics.

3.5. Estimation of Quantitative Analysis

To compute the value and profit share of actors along the chain and actors profit per kg in Ethiopian birr the following formula will be used (Dawit H/giorgis, 2017).

TC = purchase price + marketing cost

Value added = SP − purchase price

Shareof VA = $\frac{actors\ value\ added}{total\ value\ added\ along\ the\ chain}$

Profit share $\frac{actors\ profit}{total\ profit\ along\ the\ chain}$

Actors profit = SP-(PP + marketing cost)

Where,

TC - Total cost

VA - Value added

SP - Selling price

PP - Purchase price

3.5.1. Estimation of Marketing Margin

According to the term marketing margin commonly refers to the difference between a producer and consumer prices of an equivalent quantity and quality of a commodity. In short, it is a price charged for providing a mix of marketing services such as assembling, transportation, handling, packing, sorting, storage, and profit. Computing the total gross marketing margin (TGMM) is always related to the final price paid by the consumer and is expressed as a percentage. Marketing margins for the potato traders were estimated using the following formulas (Dawit H/giorgis, 2017).

TGMM = $\frac{retailing\ price - farm\ gate\ price}{retailing(consumer)price}$x 100

GMMb = $\frac{broker\ price - farm\ gate\ price}{retailing\ price}$ x 100

GMMft = $\frac{farmer\ trader\ price - broker\ price}{retailing\ price}$ x 100

GMMdw = $\frac{DW\ \ price - farmer\ trader\ price}{retailing\ price}$ X 100

GMMcw = $\frac{CW\ \ price - DW\ \ price}{retailing\ price}$ X 100

GMMr = $\frac{retailing\ \ price - whole\ saler\ \ price}{retailing\ price}$ x 100

GMMP = 100% – TGMM

Where,

TGMM indicates total gross marketing margin

GMMb indicates total gross marketing margin received by brokers

GMMft shows total gross marketing margin received by farmer-traders

GMMdw indicates total gross marketing margin received by district wholesalers

GMMcw indicates total gross marketing margin received by central wholesalers

GMMr indicates total gross marketing margin received by retailers

GMMp is the portion of the price paid by end consumer that belongs to the farmer as a producer which is 70% (100%-30%).

DW is district wholesaler price

CW is central wholesaler price.

4. RESULTS AND DISCUSSION

This chapter presents the results of the study. Descriptive analysis is employed to describe the socio-demographic characteristics of sampled farm households, traders and consumers. Value chain analysis presents the actors' costs and profit margin in potato value chain, What does potato value chain map look like in the study area?, potato value chain actors and their roles, factors affect market supply of potato at farmers' level in the district and the alternative potato market channels and the factors affecting farmers' potato market channel choice decisions.

4.1. Socio-Demographic Characteristics of Respondents

It begins by discussing findings on demographic characteristics such as sex, education level and age distribution of potato producer households. It further discuses findings of land use system and access to service.

4.1.1. Socio-economic characteristics of sampled farm households

This sub-section explains the profile of sampled respondents with regard to their age, sex, family size, and experience, level of education, access to extension services, access to markets information, distance from nearest market and development agent**.**

Sex of household respondents

Gender was analyzed by checking the number of male and female headed households. The sample population of farmer respondents considered during the survey was 118. Out of total households head interviewed 80.8% were male headed households while 19.2% were female headed households.

Education level of respondents

The survey result shows that about 41.67% of the sampled household heads were illiterate. However, 41.67% and 15% attended primary school and secondary school, respectively, whereas the smallest proportion 1.67 % are certificate holders and above. In both theoretical and practical situations, education level plays an immense role in ensuring household access to basic needs such as food, shelter and clothing. Skills and education amplify the working efficiency resulting into more income and food security. Furthermore education is important to manage the business as well as in decision making (Kadigi, 2013).

Land size and use pattern

One of the most important factors that influence crop production is resource endowment, availability of land for crop production. Land is the basic asset of the sample farmers. The survey revealed that the mean land size of sampled households was 3.5 hectares and ranges from 0.25 to 12.25 hectares in dugda district. Moreover, about 0.6 ha of land was irrigable area.

4.1.2. Access to institutional service of farm households

Access to extension service

Out of the total respondents of potato producing sample households, about 94.2% of the farmers reported that they had access to extension service in 2018 production season. Only 5.8% of the farmers reported that they had no access to extension service. The extension services providers were office of agriculture experts, DAs and innovative farmers. The extension services provided were about vegetables production, input use, seedling raising, harvesting and post-harvest handling.

Table one (1)Access to extension service

Description	**Frequency**	**Per cent**
No contact	7	5.8
Weekly	35	29.2
Once in two weeks	32	27.5
Monthly	23	19.2
Twice in a year	4	3.3
Once in year	4	3.3
Any time I ask	13	11.7
Total	118	1oo

Source: Own survey result, 2019.

Access to credit service

Finance is the crucial element starting from land preparation up to the marketing of the product. Only 12.5% of sampled producers had access to credit in dugda district. The main objectives of the credit were to purchase fertilizer (78.6%) and seeds potato (24.4%). The reason behind refusal of credit was because the majority of farmers cover cost of production of vegetable by selling grain produced by rain fall. Although credit was accessible and available for poor farmers to build asset and food secured by purchasing the different packages designed by the regional government, there is lack of attention to access and avail credit for vegetables producers.

Access of market information

Closer look at access to market information shows that there is no system in place for systematically collecting, analyzing and disseminating information relevant to the needs of different actors**.** However, almost all (90%) of sampled farmers had access to market information from different sources and only 10% had no access to market information . The type of information provided were (53.33%) about output price information, (15%) price and buyers information, (8.57%) market place information's, (4.76%) demand information and others combinations of those . The sampled respondents revealed that the major source of market information were traders, brokers, radio/television, friends/ relatives, district and kebeles administrations and combinations of those.

Access to own transport facility

The availability of well-functioning transport network is very important because it creates place utilities of the product. According to the survey result, about 76.67% of households have their own transport facility and about 23.33% have no transport facility. Moreover, the results revealed that the main means of transport were transport animals, vehicles and cart.

Off/Non-farm income activities

In the study area, motor renting, sheep and oxen fattening, daily labor, petty trade (small shops and retailing of horticulture and grain in the market) were found to be some of the off/non-farm income generating activities in which sampled farmers were participating. From sampled households about 38.3% were participating on off/non-farm income activities and 61.7% were not participating on off/non-farm income activities

4.1.3. Demographic characteristics of sampled traders

The demographic characteristic of traders includes age, family size, experience, sex, marital status, education, language and religion. The average family size of the traders is 2.9 persons and ranges from 1 to 8. The average age of the traders was 34 years and range from 22 to 50 years. The traders have an average of 8.6 years of experience in vegetables trading (ranging from 1 to 20 years trade experience). The survey further indicates that 53.3% of the sample traders were males while 46.7% of them were females. This implies that both women's and male's participation in potato trading was high. The age composition of traders was between the age group 18 to 65 which is the productive age group. About 63.3% of traders were Orthodox Christians while the remaining 26.7% and 10% were Muslims and Protestants, respectively. From sample traders 86.7% were married and 13.3% of them are single.

4.2. Potato marketing cost and margin analysis

In this sub section for calculation of different margins the average selling prices of different participants in the potato value chain (farmers, collectors, wholesalers and retailers) and marketing costs along the chain are considered. Marketing costs are estimated to compute the share of profit captured by key actors in the marketing chain. The average marketing costs incurred by every actor during transaction. The highest marketing cost was incurred by the wholesalers (132.51 birr/qt) followed by rural collectors (92 birr/qt). This is because wholesalers transport costs is higher to reach Addis Ababa market and specialized labor for the packing, loading and unloading is relatively expensive in the terminal market. Average production cost of producers was (73.03 birr/qt) when they sold to consumers and district retailers while 43.03 birr/qt when they sold to collectors because no transportation cost.

Potato average marketing costs for different marketing agents (Birr/qt)

Table two (2)Potato marketing cost

Cost of marketing	Actors				
	Producers	Rural collectors	District retailers	Wholesalers	Central retailers
Sack	10.3	10	10	10	10
Load/unload	11.5	7	18.43	10.17	5.5
Labor for packing	5		7.43	5	
Transport	30	25		40	
Storage cost				6.67	10.45
Telephone cost	5		2	3	
Wastage Loss	17.23	9	10	12.67	15.45
Personal expense				8	
Brokerage				1o	
Tax	4	7	7.57	12	12
Others cost	24	15	15	10	
Total cost	**73.03**	**92**	**70.43**	**132.51**	**63.4**

Source: Own survey result, 2019.

Table three (3) Potato marketing margin for different channels (Birr/qt).

Agents	Potato marketing channel				
	I	II	III	IV	V
Producers					
Production cost	184.42	184.42	184.42	184.42	184.42
Marketing cost	73.3	43.3	73.3		
Selling price	500	416	413.33	418.5	418.5
Market profit	242.55	188.55	155.88	234.08	234.08
GMMP (%)	100	46.22	65.76	46.5	53.32
Rural collectors		Purchase price		416	
Production cost					
Marketing cost			92		
Selling price			550		
Market profit			42		
GMMRC (%)			14.89		
District retailers		Purchase price		413.33	
Production cost			-		
Marketing cost			70.43		
Selling price			628.57		
Market profit			144.81		
GMMDR (%)			34.24		
Wholesalers	Purchase price	550		418.5	418.5
Production cost					
Marketing cost	132.51		132.51	132.51	
Selling price	785		785	785	
Market profit	102.49		233.99	233.99	
GMMW (%)	26.11		40.72	46.68	
Central retailers	Purchase price		785	785	
Production cost					
Marketing cost		63.4		63.4	
Selling price		900		900	
Market profit		51.6		51.6	
GMMCR (%)		12.78		12.78	
TGMM (%)	0	53.78	34.24	53.5	46.24

Source: Own survey result, 2019.

The above Table clearly depicted differences between the total income from potato trading and the costs incurred in the process of potato trading which gives the marketing profit of each actor namely producers, rural collectors, district retailers,

wholesalers and central retailers. The results showed that to potato producers market profit was highest when they direct sell to consumers in channel I which is 242.55 birr/qt and wholesalers in channel IV and V which is 234.08 birr/qt while take lowest market profit when they direct sell to district retailers and collectors which accounts, 155.88 birr/qt and 188.55 birr/qt, respectively. This implies producers are more profitable if they sold to wholesalers and consumers. From traders wholesalers shared the highest profit 233.99 birr/qt when they made direct purchase from producers in channel IV and V and they sold to central retailers and processors. District retailers gained the second highest profit 144.81 birr/qt on channel III, if they bought from producers and they sold to consumers. Potato rural collectors made a profit of 42 birr/qt on channel II. This implies that district retailers and wholesalers were received the highest remuneration from potato marketed in the study area while central retailers and rural collectors took the smallest profits shares from potato value chain As indicated in in the above Table, total gross marketing margin (TGMM) is highest in channel II and IV which was 53.78% and 53.5%, respectively and lowest in channel III which was 34.24%. Producer's share (GMMp) was highest in channel III which account 65.76% from the total consumers‟ price and lowest in channel-II and IV which is 46.22% and 46.5, respectively. This difference might support the theory that as the number of marketing agents increases the producers share decreases. The reason being, the higher number of middlemen in the commodity market, the more profit they retain for their services whether they add value to the item or not. The results also shows that the maximum gross marketing margin from traders was taken by wholesalers, which accounts 46.68% of the consumers‟ price in channel V and 40.72% in channel IV followed by district retailers which was 34.24% in channel VI. This implies share of market intermediaries in the consumer's price was substantial and there was a need to reduce market intermediaries to minimize the marketing margins and thereby enhance the producers‟ income. The minimum gross margin is taken by central retailer which was 12.78% in channel II and IV. The cost led pricing approach dictates that the maximum retail price of potato from farmer to consumer in the addis abeba market should be 888.21 through potato supply chain; even though the current actual retail price of potato is higher than MRP which is 950 birr per quintal. On the other hand from the consumer's point of what potato finally worth to them, the potato value chain analysis at addis abeba market revealed a maximum retail price of 600 birr per quintal on average, which is less than potato supply chain analysis of 888.21.

4.3. Value chain map of potato in the study area

Mapping a value chain facilitates a clear understanding of the sequence of activities and the key actors and relationships involved in the value chain. Mapping of value chain functions is considered to show the relationships and integrations of the processes and activities performed along the value chain. Major functions includeinput supply, production, trading, processing and consumption.

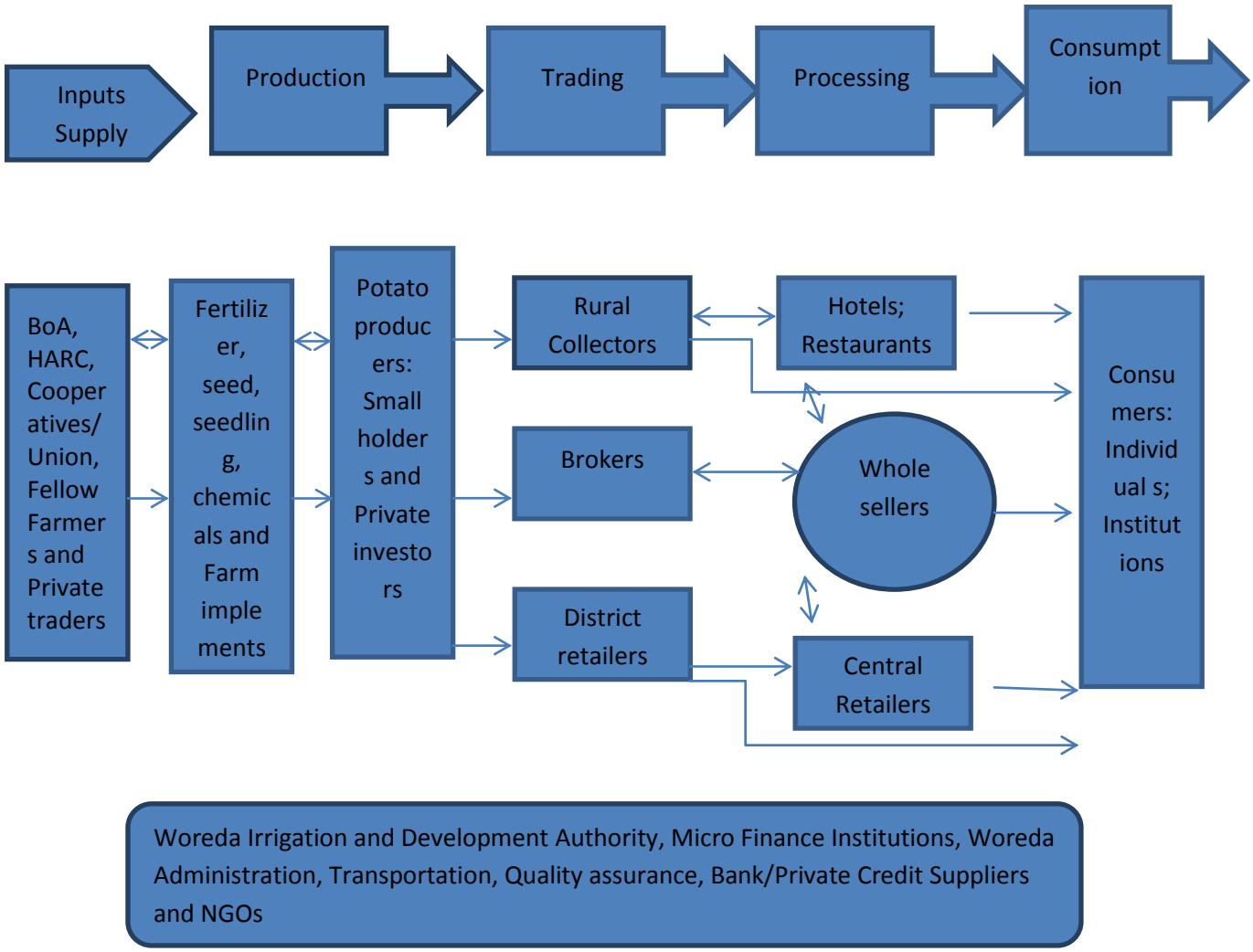


Figure 2 Value chain map of potato in the study area

Source: Own sketching

4.4. Potato value chain actors and their roles

It is clear that along with the farmers, a number of actors participated in the marketing of vegetables from the production point to the consumer point. From an institutional perspective, a value chain can be defined as the organizational arrangements linking and coordinating the producers, processors, traders, and distributors who perform

these functions (Joshi and Gurung, 2009). The main actors involved in the potato value chain, their roles and inter relationships are discussed below.

4.4.1. Inputs suppliers

Agriculture value chain analysis begins at the input supply level. Inputs such as seeds, fertilizer, pesticides, and farm implements are supplied by cooperatives, BoA, Holota Agricultural Research Centres, traders, and informal farmers to farmer's exchange. Adequacy and quality of potato seeds are crucial for increased production. Sampled producers were asked whether they use local or improved variety of seed and the largest proportion of the producers (54.2%) used improved varieties while 23.3% both improved and local varieties and (22.5%) only local varieties of vegetable seed. Regarding fertilizers, the majority of producers used inorganic fertilizer (DAP and Urea) depending on the land size allocated to vegetables and the soil fertility status as perceived by the producers while some producers used organic fertilizer (manure and compost). The results indicated that most of the sampled producers who used fertilizer procured it from cooperatives (55.5%), from BoA (41%) and from local market (3.42%) while source of organic fertilizer is producers themselves. Table four (4)

Fertilizers use (inorganic fertilizer)		
	Frequency	Percent
Yes	115	97.5
No	3	2.5
Total	**118**	**100**
Source of fertilizers		
BoA	47	41.0
Market	4	3.4
Cooperative	64	55.6
Total	**115**	**100**

Farmers purchase pesticides and herbicides from different sources. The major suppliers of chemicals are private traders from market, cooperative shops, and through the agriculture and rural development office. Regarding farm implements, the major suppliers are local market, agriculture office, and fellow farmers. Labor is an important factor of agricultural production. The labour is employed in potato production from land preparation to harvest. About 41.67% of the respondents used both family labor and hired labour for the production of potato followed by only family labour with 16.67%. About 11.67% of farmers used both family labor and labour exchange and 10.83% used hired labor and labor exchange for vegetable production.

4.4.2. Producers

Farmers are the primary and most valued actor in the vegetable value chain. Two categories of farmers were noticed in production areas: subsistence farmers and small investors‟ farmers. Producers decide, what input to use, when to seed and harvest, how much to consume, and how much to sell, considering the available resource. They perform most of the value chain functions right from farm inputs preparation on their farms to post harvest handling and marketing. The major value chain functions that vegetables producers perform include land preparation, growing/planting/, fertilization, irrigating, protecting from weed, pest/disease, harvesting and post-harvest handling and marketing.

In dugda district potato are produced based on irrigation and small number of farmers indicated that they had used rain fed system. From sampled producers about 90% are engaged on vegetable production using irrigation and remaining 10% produced vegetable under rain fed. Water for the irrigated agriculture is fundamental resource otherwise it could not be possible to cultivate vegetables. Meki River and Lake Dambal is the major source of water for sampled respondents. The survey results depicted that, about 93.58% of sampled households‟ access irrigated water from River while about 4.59 and 1.83% of irrigated waters comes from pond and hand dung hall, respectively. Most of the farmers in the districts rely on River for irrigation this was the means of water reduction. From the sampled farmers 51.7% of them have owned motors and the rest 48.3% of them rented or farmed in partnership apart from those who have motors and pumps

Source of irrigation water	Frequency	Percent
Rivers	102	93.58
Ponds	5	4.59
Hand dung Halls	2	1.83
Total	**109**	**100**

Table five (5) Source: Own survey result.

4.4.3. Rural collectors

Rural collectors are independent operators at primary markets who assemble and transport potato from smallholder farmers, using pack animals and small trucks for sale to larger markets. The local traders play the key role as in the potato value chain in area; their trading activities include buying and assembling, repacking, sorting, and selling to wholesalers typically transport on donkeys or cart to nearest town. Their major sales outlets are relatively wholesalers. And most of these outlets own or rent storage but usually do not store for more than two or three days. These local traders collect potato for wholesalers and wholesalers purchase from rural collectors by covering all cost and also additional fee for their services.

4.4.4. Brokers/middle men

Brokers in the district have regular and temporary customers from major towns and cities across the country. Brokers facilitate transaction by convincing farmers to sale his potatoes and facilitating the process of searching good quality and quantity potato to wholesalers. The share of profit that goes to brokers varies from farmer to farmer and from trader to trader. The brokers sometimes go beyond facilitation of transaction and tend to set prices and make extra benefits from the process. A few wholesalers go straight to farmers fields without using brokers to purchase the vegetables products from the farmers where they negotiate prices. Brokers do not follow proper business conduct and as a result they constrain the marketing system more than they facilitate. In case the producer is not sold through broker, they forced to sell at the lower price because of perishability of the product. The broker travel to the rural areas and contact producers, they inspect the product quality, estimate output, set price and come back to communicating with wholesalers to purchase and transport. The farmers have no idea of the price paid by the wholesalers and only receive what has been bargained with the broker.

4.4.5. Wholesalers

Wholesalers are traders that buy potato from rural collectors and also directly from farmers, usually those in surplus areas for resale in deficit, to larger market centers and retailers with better financial and information capacity. Wholesalers are the major buyers of potato as they buy at least a truck load of potato at a time from farmers. They mostly purchase from farmers and local collectors. There are no wholesalers who have the license to do wholesale in the study district. But the majority of wholesalers are located outside the districts mainly in Addis Ababa (AtikiltTera).

Wholesalers mostly purchase in bulk from the districts, transport and sell the produce to the major towns like Addis Ababa. Wholesalers buy vegetable from producers through brokers who represent them in vegetable buying activities. They have better storage, transport and communication access than other traders.

4.4.6. Retailers

Retailers are key actors in potato value chain within and outside the study area. These are known for their limited capacity of purchasing and handling products and low financial and information capacity. They are the last link between producers and consumers. There are two types of retailers in the study area district retailers and central retailers. District retailers are buying potato either from farmers or wholesale traders. While central (urban) retailers in major cities mostly they buy from wholesalers and sell to urban consumers. The supermarket and shops are mainly in the major cities and commonly buy potato from wholesalers. During the market visit, it was observed that retailers keep small amount of potatoes, onion, tomato, and other vegetables. Consumers usually buy the product from retailers as they offer according to requirement and purchasing power of the buyers.

4.4.7. Consumers

Consumers are final purchasers of vegetable products mostly from retailers for consumption purpose. Potato consumers are individual households (rural and urban dwellers) hotels and institutions. The majority of sampled consumers preferred smooth white, medium size and undamaged potato and followed by large size and clean potato. Restaurants, hotels and cafes preferred larger size, dry and undamaged potato.

4.4.8. Enablers and facilitators

In a value chain, enablers include all chain-specific actors providing regular support services or representing the common interest of the value chain actors. The supporting function players for the vegetable value chain are those who are not directly related to the vegetable value chain but provide different supports to the value chain actors. The support functions include different services (e.g. credit), research and development, infrastructure, and information. Support service providers are essential for value chain development and include sector specific input and equipment providers, financial services, extension service, and market information access and dissemination, technology suppliers, advisory service, etc. In the study areas, there are many institutions supporting the potato value chain in one way or another. The most common support providers are District Agriculture Office, District Irrigation and

Development Authority, District Trade and Market Development Office, Cooperatives, Oromia Micro Finance Institutions, Private transporters, and Holota Agricultural Research Center. Some service providers extend services beyond one function and others are limited to a specific function.

District Irrigation and Development Authority and Agricultural Development Office provide agricultural extension services to producers through experts and development agents. The office provides advisory service, facilitate access to inputs and provide technical support in seed bed preparation, fertilizer application, crop protection and post-harvest handling. The key informant's interview point out that the producers get extension service on general agriculture and it is not sufficient to improve the technical skill of the producers. Holeta Agricultural Research Center is involved in developing improved variety of potato seed for wider adaptation, high yielding and resistant to biotic and abiotic stress especially, on potato. The most common sources of loan are Oromia Micro Finance Institutions and relatives/friends, since they do not require collateral. Moreover, it was found that NGOs and Banks are operating in providing technical service and offers credit support to the farmers. But the farmers are not receiving sufficient service regarding finance related issue in the study area. In the study areas, cooperatives do not support producers in the value chain of vegetables as expected, they supply only fertilizer and sugar/oil for producers. This is due lack of adequate capital to supply inputs and lack of emphasis of district administrations to organized cooperatives in each peasants associations and functions efficiently.

4.5. Potato marketing channels

Producers sell potato through different channels. Five marketing channels of potato are exhibited in the study areas. It was estimated that 1676 quintals of potato were supplied to market by sampled farmers. Wholesalers and retailers were the main receivers of potato with percentage shares of 53.8% and 20%, respectively. The market channels identified during the survey were:

Channel I: Producer-Consumer: This channel is the shortest channel at which producers directly sell to consumers at market day. It represented 15.2% of the total potato marketed which amounted to 254.8 quintals of potato during the survey period.

Channel II: Producer-Rural collector-Wholesaler-Central retailer-Consumer: Rural collectors are buying potato from producers in the study area and they sell to wholesaler. It accounted for 11% of total potato marketed 184.36 quintals during the survey period. The channel was found to be the second least important in terms of volume.

Channel III: Producer-District retailer-Consumer: District retailers in the production area buy with or without the involvement of brokers depending on the volume of the product and resale to consumer. It represented 20% of total potato marketed 335.2 quintals during the survey period. The channel was found to be the second most important marketing channel in terms of volume.

Channel IV: Producer-Wholesaler-Central retailer-Consumer: This is the largest and most important channel, accounting for approximately 44.39% of total marketed volume of potato 744.14quintals during survey year. Wholesalers buy potato at the farm gate or at local market through brokers or directly from producers and sell it to retailers in Addis Ababa.

Channel V: Producer-Wholesaler-Processor-consumer: The only difference between the channel IV and channel V is that the wholesaler buys from producer and sold to hotels, café or institutions. It accounted for 9.39% of total potato marketed (157.5 quintals) during the survey period.

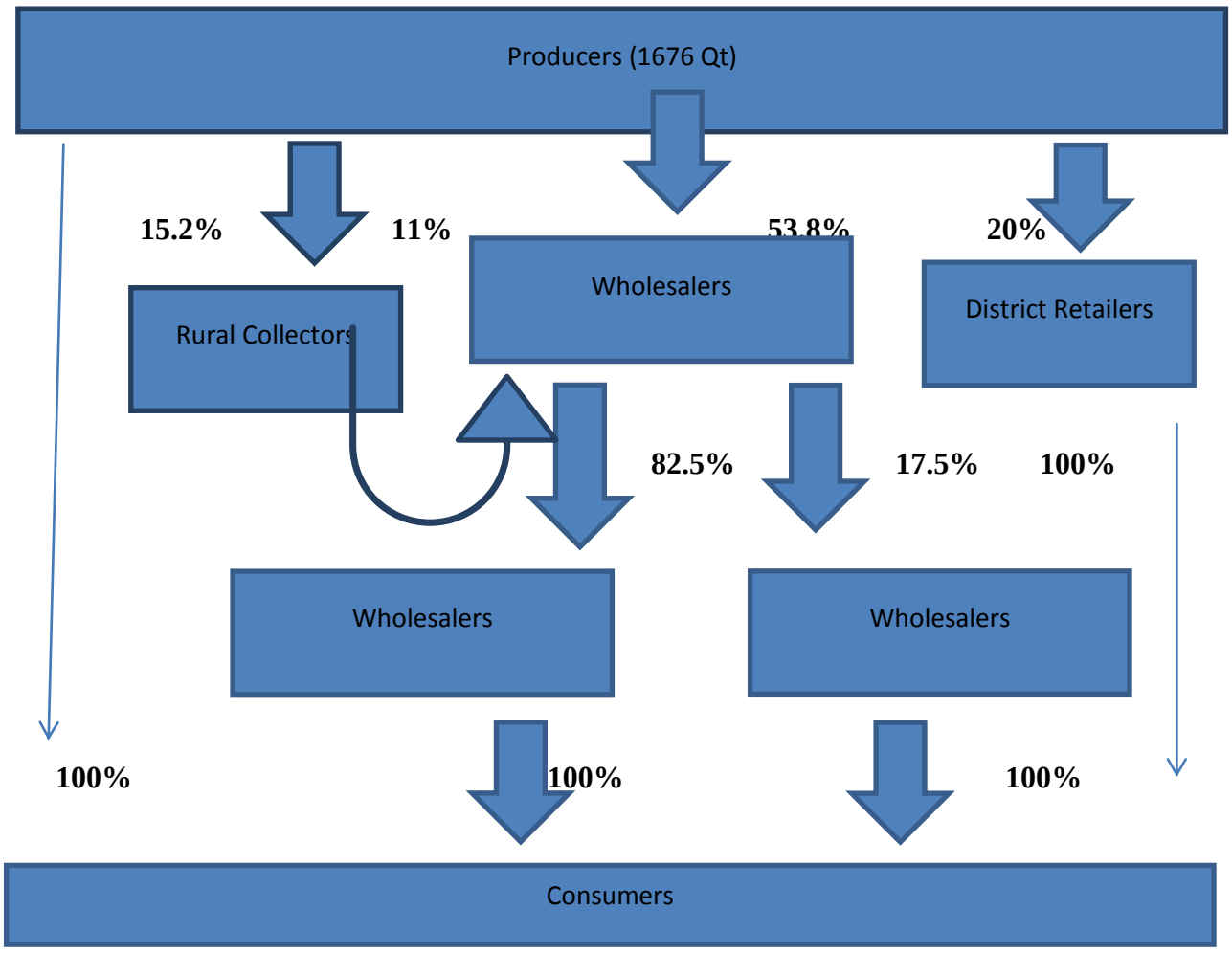


Figure 3 (three) Potato marketing channel

Source: Own sketch from survey result, 2019.

4.6. Factors Affecting Marketed Surplus of Potato and Market Channel Choices

One of the merits of value chain analysis is that it helps to clearly identify bottlenecks to the development of the chain right from input supply up until the consumption level in intense way. Accordingly, a number of constraints and opportunities are explained by different actors through focus group discussion and questionnaire. From results major constraints which are currently hindering the development of the vegetable value chain can be categorized according to the three basic stages: the farm level, the marketing/traders stage and consumer stage.

At the farm-level, key constraints faced by farmers are the shortage of good quality seed, high cost of inputs, lack of availability of adequate pesticides/herbicides, reduction of irrigation water, low irrigation facility, limited knowledge on the proper plantation, harvesting and post- harvest handling activities, diseases and pest attacks, lack of storage, and inadequate credit service. Concerning inputs supply, about 78.33% and 74.17% of sampled farmers reported problem of high cost of inputs and shortage of good quality seed, respectively. About 90% of sampled producers faced shortage of irrigation water use due to reduction of River. This will fears producers to not expand potato production and marketing.

Farmers suffer from poor post-harvest handling techniques, leading to significant losses, which affect returns to the farmer and traders. Furthermore, farmers do not have good storage facilities available at the farm level, and this forces them to sell their product immediately after harvest. Moreover, about 79.17% of producers reported disease and pest attacks - mainly fungal disease on potato as the major problems in the district. Sampled farmers reported that they were not well trained on pest and diseases control measure on their vegetables cultivation.

Variables like quantity produced, value addition, distance to market, distance to roads, non/off farm income, current price, potato market experience, sex of the household head, family size, and total livestock number (TLU) affected significantly farmers market channel choice decisions. Therefore, these variables require special attention to increase farmer’s margin from potato production and marketing so special focus need to be on these variables.

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary of major finding

This study was aimed at analyzing value chain of potato in *dugda* district, east shoa zone of oromia region, Ethiopia. The study focused on specific objectives of mapping potato value chain, identifying actors and their roles and the linkages, analyze potato marketing cost and margins across market channels, identify the determinants of potato marketed surplus and market channel choice decisions of potato farmers. The data were collected from both primary and secondary sources. The primary data were collected from individual interview using semi-structured questionnaire and key informants interviews by using guiding questionnaire. The primary data for this study were collected from 118 randomly selected potato producer households and from 42 traders from district rural markets; Data were also collected from seed input traders (suppliers) and 35 consumers. Secondary data were obtained from different sources like agricultural development office, trade and transport office, publications, CSA and web sites. Data analysis was made using descriptive statistics. The descriptive statistics measures like mean, standard deviation, frequency, ratios and graphs were used in characterizing the households, analyzing value chain and to evaluate the market performances.

The results revealed that 58.3% of sampled households had education while 41.7% of the sampled household heads are illiterate. The survey revealed that the mean land size of sampled households was 3.5 hectares and from total farm size 0.3 hectares are land allocated for potato production. Potato value chain analysis in the study area revealed that the main value chain actors being input suppliers, producers, collectors, wholesalers, retailers and consumers (including hotels and restaurants). Producers themselves, private seed traders, primary cooperatives, private chemical suppliers and NGOs were the actors involved in the input supply activities. Only small scale farmers are involved in potato production in the study area. There are also governmental and nongovernmental organizations that provided support services to potato value chain. The main supporters of the potato value chain in the study area are office of agriculture, office of trade and transport, *Holeta* Agricultural Research Center, Saving and Credit Institution and commercial banks.

Farmers and traders were behaved in different ways to pricing and selling strategies. Only 76.07% of farmers reported they had market information but it is informal. Mostly their source was from fellow farmers and others get information from direct

visit of market, traders and development agents. This implied that no formal system of disseminating market information to beneficiaries. Both traders and farmers used different selling and purchasing strategies to setting price. No group marketing in both farmers and traders side were found. Potato produced in the study area passes through several intermediaries and went out to different geographical locations.

5.2 CONCLUSION

Five different potato market channels have been identified with each channels having different marketing margin. The results showed that potato producer‟s market profit was highest when they sell to consumers in channel I which is about 242.55birr/ qt and wholesalers in channel IV and V which is about 234.08 birr/qt while took lowest market profit when they sell to district retailers and collectors which is about 155.88 birr/qt and 188.55 birr/qt, respectively. The total gross marketing margin (TGMM) was highest in channel-II and IV which was about 53.78% and 53.5%, respectively and lowest in channel-III which was about 34.24%. Producer's share (GMMp) is highest (65.76%) from the total consumers‟ price in channel-III and lowest in channel-II (46.22%) because of the involvement of the intermediaries in this channel. It is observed that as the number of intermediaries‟ increases, the producer's share in consumer's price decreases.

5.3. Recommendations

The findings of this study enabled us to make the following recommendations for policy makers, developments actors and researchers who have strong interest in promoting potato production and marketing for equal benefits among value chain actors.

- It is highly recommended to improve the input supply system so that farmers receive the right type of production inputs, quantity and quality needed at the right time. Improving system will protect farmers from purchasing low quality inputs by high inputs cost. The role of research institutes and universities are crucial in identifying high yielding and disease resistant varieties to improve production and productivity of potato.
- Irrigation enabled the farmers to produce more than once a year and this in turn increase annual production. In the study area there are rivers for irrigation in different *kebeles* so that establishing modern irrigation systems across main rivers in the district is a key intervention area that value chain supporters engaged to further enhance the production of potato and the quantity marketed in the district.

- Strengthening the linkage/interaction among value chain actors, there is a need to change the outlook of actors, by developing ground rules that will bind the relationship between producers and traders. In particular, positive attitudes toward partnership, interaction, networking and learning need to be developed among main actors in the value chain. So the chain actors should work in an integrated way to improve production, reduce post-harvest losses, and to strengthen sustainable market linkage in the study areas. In additions to this, organizing (voluntarily) traders and producers and establish trustful and strong trade agreements between the two institutions is crucial to minimize unfair price created by brokers. With a strong relationship between traders and producers, searching for market information and dissemination will be crucial.
- The results of the study showed that potato farmers were able to access wholesaler, collector, retailer and consumer channels. Different characteristics were found in factors affecting farmer's market channel choices. By considering these factors provision of education and services to the farmers on different potato marketing channels will be key in accessing the best marketing channel for increasing the farmers' profit margin. Formal or informal institutional arrangements such as farmer groups or organizations should be encouraged through which farmers can collectively access different markets which offered good prices like cooperatives, strengthening irrigation development, strengthening primary cooperatives financially, with different facilities and in skills of the cooperative management teams and employees can be one way of improving potato sector since these cooperatives can supply inputs and finally purchase the product to sell to distance areas at premium price to benefit the potato farmers. The arrangements will facilitate: use of common transport; exchange of marketing information while strengthening negotiation; bargaining position of farmers, and also make contracting and enforcement of contracts easier.
- Price is also an important factor observed to influence choice of appropriate market outlets. Increasing production alone is not enough without getting a reasonable selling price and marketing linkage. Offering reasonable price per quintal can inspire vegetables farmers to sell vegetables through the best market outlets. To enhance producers and traders associations farmers should apply better farming practice, proper post-harvest handling, and produce good quality product. The study results have also policy implications to increase

fair market share by building trust between producers and traders by improving price information networks and establish well defined linkages.

- sustained solution to inflationary pressure and price speculation by intermediary traders between farmers (suppliers) and consumers in Ethiopia is through effective value chain analysis of all commodities and tagging price at each stage of the value chain to the point of retail shop using maximum retail price setting and allowing commodity tracking at every stage of commodity movement from farmer/supplier to consumer via intermediaries.
- Finally, further studies on the value chain are recommended to identify best upgrading practices agreed by different chain actors so that a well-organized regional and national vegetable production and marketing can be implemented.

5. References

Abbot, J.C. and Makeham, J.P. 1981. Agricultural Economics and Marketing in the Tropics. Wing Tai, Cheung Printing Co. Ltd, Rome. 58p.

Abraham Tegegn. 2013. Value Chain Analysis of Vegetables: The Case of Habro and KombolchaWoredas in Oromia Region, Ethiopia. MSc Thesis, Haramaya University, Haramaya, Ethiopia.

AdaneHirpa, Meuwissen, M.P, AgajieTesfaye, Lommen, W., Lansink, A.O., AdmasuTsegaye and Struik, P.C. 2010. Analysis of seed potato systems in Ethiopia.*American journal of potato research*, 87(6): 537-552.

Adenuga, A.H., Fakayode, S.B. and Adewole, R.A. 2013. Marketing Efficiency and Determinants of Marketable Surplus in Vegetable Production in Kwara State, Nigeria.*Invited Paper Presented at the 4th International Conference of the African Association of Agricultural Economists*, September 22-25, 2013, Hammamet, Tunisia.

AFCA (Agriculture and Food Council of Alberta). 2004. *Value Chain Guidebook a Process for Value Chain Development*. (website:http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agp7974/$FILE/valuechain.pdf).

AGRIBiz (Ethiopia Agribusiness Guide).2015. http://agribiz.et/value-chains/potato/.

AlmazGiziew, WorknehNegatu, Edilegnaw Wale, and GezahegnAyele. 2014. Constraints of Vegetables Value Chain in Ethiopia: A Gender Perspective. *International Journal of Advanced Research in Management and Social Science*s, 3: 2278-6236.

Backman, T. and Davidson, R. 1962.*Marketing Principle*. The Ronal Presses Co., New York. pp. 3-24.

Baker, D. 2006. Agriculture Value Chains: Overview of Concepts and Value Chain Approach. *Presentation Prepared for the FAO LDED Regional Workshop* for Asia, Bangkok.

BezabihEmana and MengistuNigussie. 2011. Potato value chain analysis and development in Ethiopia: Case of Tigray and SNNP regions. International potato center (CIP-Ethiopia), Addis Ababa.

BezabihEmana and MengistuNigussie. 2011. Potato Value Chain Analysis and Development in Ethiopia Case of Tigray and SNNP Regions. *International Potato Center (CIP-Ethiopia*), ILRI, Addis Ababa, Ethiopia.

BezabihEmana. 2008. Value Chain Analysis of Horticultural Crops in Kombolcha Districts of Eastern Oromia Region, Ethiopia. A Study Conducted for Action Aid Ethiopia, Addis Ababa, Ethiopia.

CIP (International Potato Center). 2008. Roadmap for Investment in the Seed Potato Value Chain in Eastern Africa. CIP, Lima, Peru.

Cramer, G.L. and Jensen, W. 1982.*Agricultural Economics and Agribusiness, 2nd Edition.*McGraw Hill Book Company, USA. 222p.

Cramers, L. and Jensen, W. 1982.*Agricultural Economics and Agribusiness, 2nd Edition* McGraw Hill Book Company, New York, USA.

Dawit H/giorgis ,2017, potato value chain analysis in dugda woreda

Dolan, C, Humphrey, J and Harris-Pascal, C. 1999. „Horticulture Commodity Chains: The Impact of the UK Market on the African Fresh Vegetable Industry", *IDS Working Paper 96*, Institute of Development Studies, University of Sussex.

EIA (Ethiopia Investment Agency). 2012. Investment Opportunity Profile for the Production of Fruits and Vegetables in Ethiopia. Addis Ababa, Ethiopia.

FAO (Food and Agricultural Organization). 2013. Value Chain Analysis for Policy Making Methodological Guidelines for Quantitative Approach. VialedelleTerme di Caracalla, Rome, Italy.

GebremedhinWoldegiorgis, KassayeNegash, Atsede Solomon, AbebeChindi and BergaLemaga. 2013. Participatory Potato Seed Production: Experiences from West and Southwest Shewa and Gurage Zones. pp. 152-172. In*:* GebremedhinWoldegiorgis, Steffen Schulz and BayeBerihun. (eds.), *Proceedings of the National Workshop on Seed Potato Tuber Production and Dissemination*, 12-14 March 2012. ARARI, Bahir Dar, Ethiopia.

Gebremedhin,W., Endale, G. and Berga, L. 2008. Overview of Trends in Root and Tuber Crops Research in Ethiopia. In Root and Tuber Crops: The untapped

Resources. Pp. 1-5. in: GebremedhinWoldegiorgis, EndaleGebre and BergaLemaga ((Eds.) Ethiopian Institute of Agricultural Research (EIAR), Addis Ababa.

Gereffi, G., Humphrey, J., Kaplinsky, R. and Sturgeon, J.T. 2001. Introduction: Globalizations, Value Chains and Development. *IDS Bulletin* 32.3, 2001, Bellagio, Italy.

GetachewBeshargo. 2002. Cattle Marketing in Western Shewa. MSc Thesis, Alemaya University, Alemaya, Ethiopia.

Getachew, T., and A. Mela. 2000. The role of Self-help development international (SHDI) in Potato Seed Production in Ethiopia: Experience from Alemaya Integrated Rural Development Project. African Potato Association Conference Proceedings 5: 109–112.

Gildemacher, P.R. 2012. Innovation in seed potato systems in Eastern Africa. Doctoral Dissertation, Wageningen University, Wageningen, The Netherlands.

GTZ (German Technical Cooperation). 2007. *Value Links Manual* – The Methodology of Value Chain Promotion. *First Edition*, Eschborn, Germany. 45p.

GTZ (German Technical Cooperation). 2006. Value Chain Analysis and "*Making Markets* Work for the Poor" (M4P) –Poverty Reduction through Value Chain Promotion. GTZ, Eschborn, Germany

Haggblade, S., Veronique, T., John, S., Nango, D. and Diallo, B. 2012. A Conceptual Framework for Promoting Inclusive Agricultural Value Chains: Prepared for the International Fund for Agricultural Development (IFAD). Michigan state university, USA.

Hellin, J and Meijer, M. 2006. Guidelines for Value Chain Analysis.

Hellin, J. and Meijer, M. 2006. Guidelines for Value Chain Analysis. (Website: ftp://193.43.36.93/es/esa/lisfame/guidel_valueChain.pdf).

Heltberg, R. and Tarp, F. 2001. Agricultural Supply Response and Poverty in Mozambique.*Paper presented at the conference on "Growth and Poverty*, University of Copenhagen, Copenhagen. 25-26 May 2001. *Institute of Economics*.

Holloway, G. and Ehui, S. 2002. Expanding market participation among smallholder livestock producers: A collection of studies employing Gibbs sampling and data from the Ethiopian highlands. Socio-economic and Policy Research Working Paper.ILRI, Nairobi, Kenya.

Holloway, G. and Ehui, S. 2002. Expanding Market Participation among Smallholder Livestock Producers: A Collection of Studies Employing Gibbs Sampling and Data from the Ethiopian Highlands.Socio-economic and Policy Research *Working Paper* 48.ILRI, Nairobi, Kenya. 85p.

Islam, M., Miah, H. and Haque, M. 2001.Marketing system of marine fish in Bangladish.*Journal of Agricultural Economics*, 24(2): 127-142.

Joshi, S. R and Gurung, B. R. 2009. Potato in Bhutan, value chain analysis. Regional Agricultural Marketing and Cooperatives Office (RAMCO), Department of Agricultural Marketing and Cooperatives, Ministry of Agriculture, Mongar, India

Kadigi, L.M. 2013.Factors Influencing Choice of Milk Outlets among Smallholder Dairy Farmers in Iringa Municipality and Tanga City.

Kaplinsky, R. and Morris, M. 2001. A Handbook for Value Chain Research.Institute of Development Studies, University of Sussex, Brighton, United Kingdom.

Kassa T. Alemu. 2014. Potato value chain in Ethiopia: Cases of Sinan and Bibugn districts in East Gojjam. *Time Journals of Agriculture and Veterinary Sciences*, 2(6):114-124.

Kotler, P. and Armstrong, G. 2003. *Principle of Marketing, 10th Edition*.Hall of India Pvt. Ltd., New Delhi, India.pp 5-12.

M4P (Making Markets Work for the Poor). 2008. A Toolbook for Practitioners of Value Chain Analysis, *Version 3*, Making Markets Work for the Poor (M4P) Project, UK Department for International Development (DFID), Agricultural Development International: Phnom Penh, Cambodia.

Marshal, E. and Schreckenberg, K. 2006.Commercialization of Non-Timber Forest Products, Factors Influencing Success. Lessons Learned from Mexico and Bolivia and Policy Implications for Decision-Makers. UNEP, World Conservation and Monitoring Centre, Cambridge, UK.

MotiJaleta. 2007. Econometric Analysis of Horticultural Production and Marketing in Central and Eastern Ethiopia. PhD Dissertation, Wageningen University, The Netherlands.

MulukenMarye. 2014. Value Chain Analysis of Fruits for Debub Bench Woreda, Bench Maji Zone, SNNPR. MSc Thesis, Mekelle University, Mekelle, Ethiopia.

Pandey, K. K., Tiwari, D. and Upadhyay, S. 2013. An Economic Study on Marketed Surplus of Chickpea in Rewa District of Madhya Pradesh, India.*International Journal of Plant Animal and Environmental science*, 3(3): 2231-4490.

Pankrust, R. 1964. Notes on a History of Ethiopian Agriculture.Ethiopian Observer.

Schipmann, CH. 2006. Value chains for a better integration of smallholders to trade ; the case of chilli in Ghana. Master Thesis, Humboldt-University, Berlin, Germany.

Schmitz, H. 2005. International Labour Value Chain Analysis for Policy-Makers and Practitioners.Institute of Development Studies, University of Sussex, England.

Stevenson, G.W. and Pirog, R. 2013. Values-Based Food Supply Chains: Strategies for Agri-Food Enterprises-of-the-Middle: UW-Madison Center for Integrated Agricultural Systems and Michigan State University Center for Regional Food Systems, Michigan, USA.

Terry P. Harrison, Hau L. Lee, John J. Neale. (2004), the practice of supply chain Management: where theory And application converge', Springer Science &Business Media, Inc.

UNIDO (United Nations Industrial Development Organization). 2009. Agro-Value Chain Analysis and Development. *Working paper 3:34.*Vienna International Centre, Vienna, Austria.

VITA (Fighting Climate Hunger and Climate Change in Africa). Potato in development: Amodel of collaboration for farmers in Africa. Potato Brochure.

WoldayAmha. 1994. Food Grain Marketing Development in Ethiopia after Reform 1990. A Case Study of AlabaSiraro.The PhD Dissertation, VerlagKoster University. Berlin, Germany.

Yamane Taro. 1967. *Statistics: An Introductory Analysis, 2nd Ed*., New York: Harper and Row.

Zhang, X., Haverkort, A., Koesveld, F.V., Schepers, H., Wiljnands, J. and ,Wustman, R. 2012. Potato prospects for Ethiopia: On the road to value addition. Applied plant research, part of Wageningen University business unit arable farming, field production of vegetables and multifunctional agriculture, Netherlands.

Appendix

Addis Ababa University

School of Commerce

Department of Logistics and Supply Chain Management

Questionnaire

Dear respondents, I am KabetoTadele a master's student at school of commerce carrying out research on value chain analysis in the case of oromia national regional state, east shoa zone, dugdawereda.

This is an academic research and confidentiality is strictly emphasized, your name will not appear anywhere in the report. Kindly spare some time to complete the questionnaire attached.

Thank you Very much !!!

Potato Production

1. Potato Farming experience……..years? since_____

2. How much land do you own suitable for potato cultivation?

Cultivated through rain fed_____ irrigation_____ (timad)

3. Please provide the following information.

A) potato variety types and annual production (2010/11 E.C)

Potato varieties	Area Planted (timad)			Quantity harvested (Qt)			total
	Rain feed	irrigated	Residual moisture	Rainfed	Irrigated	Residual moisture	
Local							
improved							

4. Do you produce potato as sole crop or intercrop with other crops?

1. Sole cropping 2. Intercropping 3. Both Inter cropping and sole cropping

5. If you practice intercropping with what crop(s) do you intercrop?

_____

6. What type of potato variety do you currently growing?

1. Local 2. Improved (name) _____ _____ 3. Both

7. If improved variety, where did you get the seed of improved variety?

1. Local market 2. Fellow farmers 3.Cooperatives 4. Agricultural office

5. University (specify) _____ 6. NGO (specify) _____

8. Research centre (specify) _____8. Others (specify) _____

8. Did you obtain fertilizer on time? 1, yes 2, no

9. If you use improved variety (ies) why do you decided to produce?

1. Awareness and availability of improved potato varieties

2. Presence of high market demand 3) Technical and material support from GOs and NGOs

4) High productivity 5) high preference for household consumption 6) need for crop diversification

10. Did you get enough yield from the potato variety you currently grow?

1. Yes 2. No

11. If no what are the major reasons for low yield?

1. Poor quality seed 2. Disease/insect 3. Natural hazards 4. Low productivity

4. Others (specify)_____

12. Do you store your potato either for home consumption or market? 1. Yes 2. No

13. If yes, where did you store potato?

1. DLS (modern) 2. Traditional storage house 3. Spread on the floor inside the house

4 Bed prepared in the house 5. Others (specify) _____

14. For how long do you stored potato for purpose of household own consumption?

_____(maximum periods)

15. How long do you keep usually potato to sell?____ on average

16. Is potato product loss is a problem for you? 1. Yes 2. No

Potato MarketingPractices

1. Marketing experience of potato in years? _____since when? _____

2. Did you sell potato in the year 2010/2011 E.C)? 1. Yes 2. No

3. If your answer for Q2 is No, why you did not sell? _____

4. If your answer for Q2 is yes, how much and to whom did you sell your product? (*Write the codes and multiple result is possible)

Amount sold (Qt)	Price per Qt	*To whom 1. Collectors 2. Consumers 3. Retailers 4.Wholesalers 5. Institutions (hotels, Universities, etc) 6.Cooperatives 7. Others (specify)/	Terms of Sell (1=cash 2=credit 3=advance payment)	Where (1.Farm gate 2. Nearest market center 3.main market 4. Others (specify	Frequency of sale in a year to the respective market outlets (market agents)	transportation means used (1. On donkey/horse back load 2. By Vehicles 3. On human back load 4. Horse/ donkey carts 5. Other (specify)).

4. Why have you preferred the mentioned buyers/markets to sell your product?

1. Pay fair price 2. Reliable (always purchase) 3.Accessibility 4. Only available channel

5. Don’t know anywhere else to sell 6. Low quality (not fit for other channels) 7. Others

5. Do your potato products have preferred qualities by buyers? 1. Yes 2. No

6. If your answer for Q5 is No, what interventions are needed to improve quality of potato crop production to attract better prices? _____

7. Do you consider quality requirement of your buyers in your production process? 1. Yes 2. No

8. Do you have any contract with your buyer? 1. Yes 2. No

9. If yes, what type of contract? 1. Written contract, 2. Verbal contract

10. The requirements the current channel(s) use to purchase? 1. Quality 2. Size 3.Transport 4.Group member 5.Contract 6.Variety 7. Other (specify)

11. What is the main constraint to targeting the preferred channel? 1. Cost 2. Quantity 3.Quality 4.Low price 5.Unreliable market 6.Lack of information 7. Other (specify)

12. What facilitation do you need to target the preferred channel?

1. Transport 2. Modern storage 3.Processing 4.Market information 6. Other (specify)

13. Are you satisfied with your current main channel(s)? 1. Yes 2. No

14. If No, which channel (s) would you rather sell to?

_____

15. How do you evaluate the local market price? 1. High 2. Medium 3. Low

16. Do you have marketing information before you sold? 1. Yes 2. No

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17. If your answer for Q16 is yes, from whom did you get the market information? 1. DAs 2. Keble administration 3.Woreda marketing office 4.Radio 5.Brokers 6. Visit market 7. Fellow farmers 8. Others (specify)

18. What type of information did you get? 1. Price information 2. Market place information 3.Buyers' information 4. Other (specify)

19. At what time interval do you get the information? 1. Daily 2. Weekly 3.Monthly 4.Other(specify)

Trader's interview questionnaire

Date of interview dd/mm/yy_____ Questionnaire ID.No._____

Name of enumerator_____

Data checked by_____ checked date (dd/mm/yy)_____

Data entered by_____ data entry date (dd/mm/yy)_____

I. General Information

1 Name and position of the respondent _____ Age_____ Sex_____

2 Name trade :_____

3 Owner name:_____

4 Address: Region _____Zone_____ Woreda_____ Town_____ kebele____

5 Name of market (work place)_____

6 Type of trade: 1. Retailer 2. Wholeselers 3.Collectors 4.Others(specify)_____

7 Marital status of trade owner 1.Single 2.Married 3.Divorced 4.widowed

8 Family size of owner: 1. Male_____ 2. Female_____ Total_____

9 Educational level of the business owner. 1. No formal education (illiterate) 2. Adult education 3._____grade 4.Certificate 5.Diploma 6. Degree

10 Education level of a manager if available?

_____

11 Did you trade alone or in partnership? 1. Private Individual 2. Private partnership / share company 3. Other (specify) _____

12 If partnership, how many are you in the joint venture? Share holders_____

Potato Demand, Purchases and consumption

13. Is potato consumed in your family? 1. Yes 2.No

14. Experience in potato products consumption? _____ Years

15. Sources of potato you consume? 1. through Purchase 2. Own Produce 3. Others (specify)_____

16. If you purchase, how much income you spent on potato purchasing per year/month/ week/day?

_____

_____

17. Frequency of potato purchase per week/month? _____

Marketing Aspects

1. How long have you been in potato trading? _____years.

2. What is your source of working capital for potato trading? 1. Own (_____%) 2. Loan (_____%) 3. Gift (_____%) 4. Share (_____%) 5. Others (specify)

3. If loan, from whom did you borrow?

1. Bank 2. Microfinance institutions 3.Relative/family 4..Friend 5.Other traders 7. . Others (specify)_____

4. Amount of loan? _____birr. Loan repayment period?_____

5. How much was the rate of interest? _____% for formal, _____% for informal.

6. Do you have any value addition activity on your potato products? 1. Yes 2. No

7. If your answer for Q6 is yes, what are those value adding activities?

1. Cleaning 2. Storage 3. Sorting and/or grading 4. Processing 5.Transporting to other locations 6. Others (specify)

8. Do you involve in potato trading year round? 1. Yes 2. No

9. If no, at what period of the year do you involve?

1. During my free time 3. When purchase price becomes low

2. during high supply (when the product is available on the market)

4. during high demand 5. Other (specify) _____

10. How many regular suppliers do you have?

Producers _____, Collectors __, Processors _____, Wholesalers __, Retailers ___, others (specify)_____

11. How did you bought potato?

1. Direct from seller 2. Through broker 3. Through commission agent

4. Other (specify) _____

12. How many regular buyers do you have?

Wholesalers_____, Consumers_____, Processors _____, collectors_____, Retailers _____, exporters_____, others_____

13. How did you sell potato?

1. Direct to the purchaser 2. Through broker 3.By commission agent 4. Other (specify)__

14. How do you attract your suppliers?

1. Giving better price 2. By visiting those 3. Advance payment 4. Other, specify _____

15. How do you attract buyers?

1. Giving better price 2. By visiting those 3. Sell on credit 4. Other, specify _____

16. Is there any fluctuation of volume in potato brought to the market? 1. Yes 2. No

17. If your answer to Q16 is yes, the reason is _____

1. Due to price fluctuation 2. The existence of supply variations

3. The existence of supply variations 4. Seasonal production

5. Due to climatic change 6. Others, specify _____

18 What is your packaging material?

1. Sisal sack 2. Plastic sack 3.Basket 4. Others _____

19. Who sets the purchase price? 1. Myself 2. Sellers 3. Set by demand and supply 4. Set by negotiation 4. Other (specify)

20. Who sets selling price in? 1. Myself 2.Buyers 3. Set by demand and supply 4. Set by negotiation 4. Other (specify)_____

21. How do you evaluate the 2018/19 (2010 E.C) market price of potato in comparison with last year?

1. decreased 2. Constant 3. Increased 4. Fluctuated throughout the time

22. How do you fix the selling price of potato?

1. consideringlabor and other costs 2. The market forces of supply and demand

3. Based on the quality of potato 4. Based on the size and color of potato

5. On the origin of potato 6. Considering purchase price 7. Others specify _____

III Consumers Interview questionnaire

I. General Information

1. Name of Respondent: _____

2. Zone: _____ Woreda:_____Kebele: _____ village: _____

3. Age of the respondent: _____ years

4. Sex of the respondent: 1. Male 2. Female: family size_____

5. Education level of the respondent: 1. No formal education (illiterate) 2. Adult education

3. _____grade 4. Certificate 5.Diploma 6. Degree

6. Marital status: 1. Single 2. Married 3.Divorced 4. Widowed

7. Distance to nearest town: (_____) Kms OR (_____) hrs walk time

8. What is your major means of income generation? 1. Farming 2. Trade 3. Government Employed 4. NGO employed 5. Others

9. Do you have secondary occupation? 1. Yes 2. No

10. If yes, name of secondary occupations?

_____

11. How much income do you earn per year (estimate based on weekily, monthly income):___Birr

12. From whom you buy potato for consumption?

Wholesalers_____, producers_____, Processors _____, collectors_____, Retailers _____, exporters_____, others_____

13. how much you went to pay for 1kg of potato you purchased?

1, 4birr/kg 2, 5birr/kg 3, 6birr/kg 4, 7birr/kg 5,8birr/kg 6,9birr/kg 7, others specify