ABSTRACT

Even, in the study area potato is very important for food security there is a gap in the potato value chain analysis. Therefore this study has attempted to identify potato value chain analysis in Lemo woreda of Hadya zone southern Ethiopia. In this study, both quantitative and qualitative data types were employed. Data were obtained from a sample of 202 producers, 37 traders (6 Wholesaler, 8 Collector, 4 Processor, and 19 Retailer), and 24 consumers by using semi-structured questionnaires. To take sample from the actor both probability and non-probability sampling techniques’ were used. For data analysis, descriptive statistics was employed. The result shows that the main potato value chain actors were input suppliers, producers’, wholesalers, collectors’, retailers, processors, and consumers. And Supporting actors were cooperative, banks, universities, Ethio-telecom, research institutions, NGOs, and government offices. Potato value chain opportunity and constraints were identified at the producer, trader, and consumer stages. Performances analysis in the value chain shows that, the highest share of profit, cost, and the market margin was shared to the producer which accounts for 43.01%, 33.55%, and 39.07% of share respectively. Based on the findings of the study, I recommend that the government and concerned stakeholders should focus on promoting improved potato seed, encouraging education, promoting farmers’ cooperatives, empowering females, strengthening rural-urban infrastructure, and protecting informal labor trading.

Keywords: Value chain actors; Potato; Opportunity; Constraint

1. INTRODUCTION

Agriculture is the major driver of economic growth and contributing to long term food security in Ethiopia. It contributes about 31.2% of GDP, 65.33% of employment, and 79.24% of the population lives in rural areas that rely on agriculture for their livelihoods (Global Economy, 2020). In the 2019/20 budget year, the Ethiopian government committed to 38.8 percent of expenditures to the whole economy from this, 15.5 percent of the expenditure is for Agricultural and Rural Development activities (Macro research Ethiopia, 2019). According to trading economics.com, (2020) report, the agricultural sector also covers over 87 percent of export value. It is also the sector that is given an overriding focus in the government’s plan for the growth of the economy as a whole.

Among Agricultural products, Potato (Solanum tuberosum L) commodity is one of the most leading vegetable crops in Ethiopia. Nutritionally, it is considered to be a well-balanced major plant food ranging from the macro-components to micro-nutrients. Because of its high yielding ability in a short season; the presence of suitable agro-ecological zones; the availability of labor for its production on large areas of land; and the
accessibility of a potential market with considerable added value on it, potato is an important food and cash crop as income sources in Ethiopia (Yazie et al., 2017). It could play a key role in ensuring national food security in Ethiopia ((FAOSTAT, 2019; Gebru et al., 2017).

According to the report of (FAOSTAT, 2019; CSA, 2018; and Lemo district agriculture and rural development office (LDARDO), 2019)) the productivities’ of potato was 13.8, 17.58, 19.93, and 21 tons per hectare in Ethiopia, SNNP Region, Hadiya zone, and Lemo woreda respectively. Though, according to Gebru et al. (2017) Potato is produced mostly for local consumption and the local market in Ethiopia.

To attain food security, focusing on production and productivity in the Potato crop has been considered as a strategic crop by the Ethiopian government (Bekela and Tadesse, 2019). But only specialize in improvement in production and productivities of potatoes can’t sustain food security issues so, the value-adding system may be a critical one to enhance the livelihood of smallholder potato producers and is required to satisfy the growing food demands.

According to Spore, (2012) to connect actors along a chain to produce and deliver goods and services through a sequenced and coordinated set of activities’ adds value at all stages (production, processing, and distribution). So, for potatoes value chain activities smallholder farmers should be empowered through Promoting farmer cooperation; provision of training on value addition, crop products hygiene, market information seeking, developing infrastructure, providing incentives and promoting integrated with supply and processing and marketing sectors, promoting participatory methods in research and technology development and supporting pro-poor research and advisory services that are smallholder oriented.

Value chain activity involves multiple actors; however, the majority of actors within the value-chains are small and informal with limited resources and gaps in funding and technical skills. This imposes many barriers to agricultural growth: the inefficient scale of activities; high transaction costs; and insufficient information is due to end market to producer; highly fragmented midstream marketing impairs the links between farmers and traders as sited by (Nefisa, 2018) from the Bill and Melinda Gate Foundation (BMGF, 2010).

Low value activities for potato happened at the farmers, brokers, or wholesalers, retailers, and even consumer levels (Belayneh, 2018; Biruk et al., 2017; Habitamu, 2015). Among the potato value chain, there is an informal way of communication in the market. This shows a lack of integration among chain actors as a constraint of the potato value chain. The study conducted by Awoke and Molla, (2018); the shortage of improved seed, limited access to market information, poor linkage, price cheating, disease, and other factors are Potato production constraints in Ethiopia.

According to Biruk et al., (2017); Bezabih and Mengistu, (2011) inadequate input supply, lack of adequate storage, perishability, lack of processing facilities; low skill in technology for processing, price fluctuation, seasonality, and low skill in post-harvest
management are the main challenges for the potato value chain system in Ethiopia. Abraham, (2013) stated that limited access to the market, low price of the product, lack of storage, lack of transport, low quality of the product, and lack of policy framework to control the illegal trade route is the major marketing problems.

In the study area, potato value chain actors are not still well-identified those who are wholesalers, retailers, and collectors study area; the reason because of the absence of a legal framework for some horticultural crops like potatoes. So, the development and upgrading of the value chains is a crucial agenda for the govt, companies, and other institutions. Entry into higher-value markets (also global markets) requires an understanding of the wants and dynamic forces within the value chain (Baker, 2006). Understanding existing potatoes' inputs supply systems, production, and marketing systems of potato is vital for developing well-organized value chain development within the study area.

Thus, this study was conducted to analyze the value chain of potatoes products to identify and prioritize the activities that currently undertaking, mapping and examining value chain performances among different actors, identifying the constraints and opportunity on the potato product.

2. RESEARCH METHODOLOGY

2.1. Description of the Study Area

The study was carried out in Lemo district, Southern Ethiopia. Its capital city is Hossana, located at about 232 kilometers from Addis Abeba to the south on the road running from Addis Abeba to Wolayta Sodo and 208 kilometers away from Hawassa, the capital city of Southern Nations, Nationalities, and Peoples Regional State. The Woreda lies between 7º.14’ to 7º.45’ North Latitude and 37º.05’ to 37º.50’ East Longitude with an altitude range of 1990 – 2720 m.a.s.l. The mean annual rainfall varies between 700 mm to 1226 mm, and the mean annual temperature varies between 15ºC and 20ºC. It is bordered by Silte Zone in the North, Kembata Tembaro Zone in the South, Gombora Woreda of Hadiyya Zone in the North West, Ana Lemo Woreda of Hadiyya Zone in the North East and Shashogo Woreda of Hadiyya Zone in the East.

The household heads in the study area were 20533. The district is classified into two climatic zones: Dega or the highland (16.7%), Weina Dega, or midland (83.3%). The soil type of the area is loam soil. The area has been identified as having great agriculture and market potential, and the farmers’ in the area are smallholders and the field is also prepared manually with the help of oxen power. Farms are mixed in terms of crops and livestock. Major root crop components of the area are covered by potatoes.

Types of crops grown in the area are potatoes, wheat, faba bean, Enset, barley, oat, teff, pea, coffee, and the like. According to the Woreda council annual report (2017), the Woreda has a total of 33 rural and 2(two) urban kebele.
2.2. Data Type, Sources, and Methods of Data Collection

For this study, both quantitative and qualitative types of data were employed. To collect those data both primary and secondary data sources were employed. Primary data was collected from potato value chain actors. Secondary data sources were reviewed through reviewing different works of literature such as books, journals, thesis (different research reports), different unpublished organizational reports and documents, website information, and CSA which are found relevant for the study. Primary data was collected from sample representatives’ by recruited enumerators; who were fulfilled minimum requirements like familiar with the study area, translate the English language to local and those collectors were trained about the objectives of the study with the supervision of the researcher. Focus Group Discussion (FGD) by using checklists was also used to collect data to support survey data and other information that not collected during individual interviews. The focus group discussion member were conducted from each sample kebeles, deep interview was conduct to cross-check the collected data.

2.3. Sample Size and Sampling Procedures

1. Producers sample

To take potato producers’ sample respondents, both probability and nonprobability sampling techniques were employed. In the first stage, the purposive sampling technique was employed to select Lemo woreda the reason because the woreda is more potential in potato production. In the 2nd stage, out of thirty-three kebeles, three kebele was selected by using a simple random sampling technique. The reason was to give equal chances for all kebeles to be sample selection. The other reason, all kebeles in the woreda were potato producers. After the selection of kebeles, Potato producing households list was obtained from each kebele’s leader’s. By using that list, 202 households were selected for the survey by using formula. That means, in the study area, the total household head number was 20,533 from those 202 household heads sample size was determined. To determine the sample size of potato producers/farmers for this study, Yamane’s, (1967) formula was employ.
\[ n = \frac{N}{1 + N(e^2)} \]

\[ n = \frac{20533}{1 + 20533(0.07)^2} = 202 \]

Where: \( n \) = is the sample size \( N \) = is the total Potato producer households in selected kebeles \( e \) = is the level of precision (0.07)

Finally, proportional to population size was employed to select the sample households from each kebeles as follows.

Table 1 probability proportional to the size for producer sample

| Name of kebele | Total potato producers | Proportion | Sample |
|----------------|------------------------|------------|--------|
| 1st Omoshora   | 767                    | 0.40       | 79     |
| Heyise         | 498                    | 0.26       | 52     |
| Jawe           | 670                    | 0.34       | 71     |
| Total          | 1935                   | 1          | 202    |

source: own compilation based on kebeles information

2. Rural collector, wholesalers, retailers, and consumers sampling

In addition to farmer households, 37 traders (6 wholesalers, 8 collectors, 4 processors, and 19 retailers), and 24 consumers were interviewed. For this reason, the pre-market study was employed to select potatoes traders' and consumers' because of potato traders' numbers not well known by the district trade and industry office. For that reason to take sample traders like wholesalers, collectors and retailers snowball sampling techniques were employed during market visit. To collect data from traders' and consumers’ Wachemo market, the Mare market, and the Jawe market that nearer to selected kebeles were selected. Finally, for the sake of cross-checking collected data the key informant and focus group discussions were employed.

2.3. Methods of Data Analysis

In the study to analysis Potato value actors and their function, to identify opportunity and constraints among potato value chain actors, and to value chain mapping and examine the performance of actors in the chain; a value chain analysis approach, value chain map, SWOT analysis, and market performance.

1. value chain analysis approach: A market chain comprises the economic actors who produce and transact a particular product as it moves from primary producer to final consumer. These actors include small and large-scale producers, input suppliers, traders, processors, transporters, wholesalers, and retailers (UNIDO, 2009).

2. Mapping the value chain: mapping the value chain used to visualize the chain actors, identify their roles, linkage among them. For mapping, the value chain actors' data was
required by conducting surveys and interviews as well as by reviewing secondary data from various sources. The Market Map is a tool used to visualize the market as a system (Kaplinsky and Morris, 2001).

3. Strengths, Weaknesses, Opportunities, and Threats; (SWOT) analysis

To analysis, the threats and opportunity in the business activities SWOT Analysis approach is the most renowned tool for audit and analysis of the overall strategic position of the business and its environment (Osita, Onyebuchi, and Justina, 2014). Its key purpose is to identify the strategies that create a firm specific business model that to align an organization’s resources and capabilities to the requirements of the environment in which the firm operates. In other words, it is the foundation for evaluating the internal potential and limitations and probable/likely opportunities and threats from the external environment. It views all positive and negative factors inside (Strengths & weakness) and outside (Opportunities & constraints) the firm that affects success.

4. Market performance: The two approaches to measuring marketing performance was required the marketing margin and the marketing cost. A large number of studies had been analyzed the marketing margins for different types of commodities to examine the performance of agricultural products marketing and argued that even though variations in the margin over time might be attributable to marginal marketing costs under perfect computation, additional factors such as seasonality, technological changes, and sales volume may also explain the variations in the margin (Sultan, 2016).

The marketing margin is important indices in the evaluation of value chain performance. It is the difference in the price paid by consumers and that received by the producers (Xaba & Masuku 2013; Ghorbani, 2008). Marketing margins are also calculated at different points along the value chain and then compared with a consumer price.

To find the benefit share of each actor the concept of marketing margin would be applied with some adjustments. In analyzing margins, first, the total gross marketing margin (TGMM) will be calculated. This is the difference between producer’s (farmer’s) price and consumer’s price (price paid by the final consumer) i.e.

\[
\text{TGMM} = \text{Consumer’s price} - \text{Farmer’s price}
\]

Then, the marketing margin at a given stage ‘i’ (GMMi) is computed as:

\[
GMM = \frac{SP_i - PP_i}{TGMM} \times 100
\]

Where SPi is the selling price at the ith link and PPi is the purchase price at the ith link.

The total gross profit margin also computed as:

\[
\text{TGPM}=\text{TGMM}-\text{TOE}
\]

Where TGPM is a total gross profit margin, TGMM is a total gross marketing margin and TOE is a total operating expense. It is useful to introduce the idea of “producer’s participation producers’ portion”, or producers’ then profit margin at stage “i” is given as;
Where \( GPM_i = \frac{GMM_i - OE_i}{TGPM} \times 100 \)

Where \( GPM_i \) = Gross profit margin at ith link, \( GMM_i \) = Gross marketing margin at ith link, \( OE_i \) = Operating expense at ith link, \( TGPM \) = Total gross profit margin

In the marketing chain with only one trader between producer and consumer, the net marketing margin (NMM) is the percentage over the final price earned by the intermediaries as his/her net income once his marketing costs are deducted.

\[
NMM = \frac{Growth \text{ marketing Margin} - \text{marketing cost}}{\text{price paid by consumer}} \times 100
\]

3. RESULT AND DISCUSSION

3.1 Value Chain Analysis

Potato value chain map

Mapping a value chain facilitates a clear understanding of the sequence of activities and the key actors and relationships involved in the value chain. The 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 include input supply, production, trading, processing, and consumption.

![Value chain mapping of potato in the study area](image)

Source: own computation from the survey result, 2020

**Potato value chain actors and their respective roles**

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

1. Primary value chain actors
Primary actors in the potato value chain in Lemo woreda were seed and other input suppliers, farmers, traders, and consumers. Each of these actors adds value to the process of changing the product title. Some functions or roles are performed by more than one actor, and some actors perform more than one role.

1.2. Input suppliers
At this stage of the value chain, there were many actors involved directly or indirectly in agricultural input supply in the study area. That input supplier includes seed suppliers, fertilizer suppliers, chemical suppliers, and the like.

Table 2 Source of potato seeds for sample respondents

| Source of seed         | Freq. | Percentage |
|------------------------|-------|------------|
| Own                    | 68    | 33.66      |
| Govt/non-govt          | 11    | 5.45       |
| Cooperatives           | 41    | 20.30      |
| Private trader/farmer  | 82    | 40.59      |
| **Total**              | **202**| **100**    |

Source: own computation from the survey result, 2020

The table 2 indicates that in the Lemo woreda sample farmers 33.66%, 5.45%, 20.30%, and 40.59% used potato seed from own, government, cooperative, and private traders/other farmers in the local area.

Producers: Those are smallholders who are engaged in potato production. They are major actors involved in the production and marketing of surpluses they produce, which starts from input preparation to final harvesting. The major activities in production were land preparation, sowing, fertilizer application, cultivation, weeding, chemicals spraying, harvesting, and postharvest management. Sampled households have access to seed, fertilizers, and chemicals from nearby cooperatives, agricultural and rural development offices, a private trader, and private seed vendors. They did not have access to irrigation and they depend on rain-fed.

Producers transport potato to sell into the nearest markets or district markets by themselves, either using a track, pack animals, or animal-driven carts over an average of 50.123 minutes walking distance by potato producers. They had several options to sell their product; selling directly or selling through assemblers. Alternatively, they sell to village assemblers known as “farmer traders”/”rural assembler” who assemble potato from a large number of farmers.
Collectors: These are the main actors in the potato value chain who collects potato from farmers’ in village markets or at the farm gate to resell it to wholesalers and retailers in nearer markets. They use their financial resources and their local knowledge to bulk potato products from the surrounding area. Collectors are also the main actors in the potato value chain activities, they responsible for transport potato from production areas to wholesale and retail markets. The activities of collectors in the value chain include buying and assembling, cleaning, repacking, transporting, and selling to wholesale and retail markets.

Wholesalers: Wholesalers are also the main actors in the potato value chain and are involved in purchasing potato from collectors, cooperative, and producers in large volume than any other actors and sale them to retailers, processors, and consumers. The survey result indicates that wholesale markets are the main assembly centers for potato products in their respective surrounding areas. They have a better storage place, transport access, and communication access than other traders. Most of the wholesalers’ have a warehouse in a market either self-owned or on a rental basis.

Retailers: This is one of the final links in the chain that delivers potato to processors and consumers. Retailer’s involvement in the chain includes buying potato, transporting to retail to workplace, grouping, and selling to consumers. They mostly buy potato products from producers, collectors, and wholesalers and sell them to processors and consumers. Consumers usually buy the product from retailers as they offer according to the requirement and purchasing power of buyers. Retailers’ are located in urban and rural market centers. Rural retailers are based in village markets and mainly purchase potato from farmers and sell them to processors and consumers. Urban retailers purchase from farmers, collectors, and wholesalers and sell them to urban consumers.

Processors: Processors are the main actors in the potato value chain in the study area. They found in the town areas in hotels and restaurants, café, and around the roadside, those actors add value through changing product forms. Potato processors process tuber into chips, woti, and like before selling to end consumers,

Consumers: Consumers are actors in potato value chain activity those who purchase potatoes for consumption. They are the last link in the potato value chain. The potato products value chain ended at consumers who buy the products for the ultimate consumption. In the study areas, marketed potatoes reach consumers through direct purchasing from farmers, processors, wholesalers, and retailers as food. The survey result also showed that, on average, 60% of potato produced in the year 2019/20 was consumed by the consumers. Even though the number of consumers varies from place to place; they are mostly residents of the rural and urban, peoples visiting markets, travelers, etc.

Support service providers: Value chain supporters or enablers provide support services and embody the common interests of the value chain operators. Such actors are those who provide supportive services including training and advisory, information, financial, and research services. The main supporters of the potato value chain in the study area are the Bureau of Agriculture and Rural Development (BoARD), marketing and cooperative development and Bureau of Trade and Industry, OMO microfinance, wisdom & Agre
credit institutions, Wachemo University, farmer training center, peasant association, NGOs and banks.

Enablers are outsiders who regulate the business process and restrict themselves to temporarily facilitating a chain upgrading strategy. Typical of their tasks include creating awareness, facilitating joint strategy building and action, and the coordination of support activities. These actors play a central role in the provision of such services and enabling environments include the policies and infrastructure. From the broader perspective, agricultural focused policy of the country might be considered as a supportive policy for the proper functioning of the potato value chain development in the country in general and in the study area in particular.

3.2. Performance analysis of potato value chain actors

Marketing Profit and Cost: The result indicates in table 3 shows that producers account highest marketing and production cost share. That means 39.07% share of the total cost accounted by producers. And the lowest marketing cost share account by collectors 8.44%. On the other side 43.01%, 9.09%, 11.62%, 13.03%, and 23.25% profit share transferred for producers, collectors, wholesalers, retailers, and processors respectively. This indicates that there is an unequal profit share between value chain actors.

Marketing margin analysis deals with the share of the final selling price that is captured by a particular agent in the marketing chain and always related to the final price or the price paid by the end consumer, expressed in percentage. It is useful to introduce here the idea of “producer participation,” “farmer’s portion” or “producer’s gross margin” which is the portion of the price paid by the end consumer that belongs to the farmer as a producer. It should be emphasized that growers that act as middlemen also receive an additional marketing margin. Based on this fact, it is possible to see the value distribution among potato value chain actors for the nine major marketing channels.

In table 4 survey results revealed that the highest total market margin was channel X and XI which accounts for 53.74% and the lowest total market gross margin was channel V which accounts for 28.50%. Because the least total gross market margin share is due to the absence of intervention of any intermediaries who could reduce the share of potato. In general, the producer’s share of consumer price is less than 71.50% and more than 46.26% in all channels except channel I where producers sell directly to consumers. The highest market margin for producers was channel V which accounts for 71.50% of consumers’ price share next to channel I. The reason might be wholesalers’ pay good price for producers and they sell for consumers without other mediators.
Table 3: Average marketing costs and benefits of actors for different market agents (Birr/qt)

| Cost of marketing   | Producers | Collectors | Wholesalers | Retailers | Processors | Total    |
|---------------------|-----------|------------|-------------|-----------|------------|----------|
| Purchasing price    | -         | 800.5      | 891.20      | 1103.12   | 1290.12    | 4364.94  |
| Production cost     | 145.59    | -          | -           | -         | 35         | 180.59   |
| Market cost         | 101.17    | 53.31      | 115.49      | 83.69     | 97.28      | 450.94   |
| Total marketing cost| 246.76    | 53.31      | 115.49      | 83.69     | 132.28     | 631.53   |
| Total cost (%)      | 39.07%    | 8.44%      | 18.29%      | 13.25%    | 20.95%     | 100%     |
| Selling price       | 834.23    | 978        | 1165.5      | 1364.74   | 1740       | 6082.47  |
| Market margin       | 587.47    | 177.5      | 274.3       | 261.62    | 449.89     | 1750.77  |
| % Share of margin   | 33.55%    | 10.14%     | 15.67%      | 14.94%    | 25.70%     | 100%     |
| Profit margin       | 587.47    | 124.19     | 158.81      | 177.93    | 317.6      | 1366     |
| % Share of profit   | 43.01%    | 9.09%      | 11.62%      | 13.03%    | 23.25%     | 100%     |

Source: Own computation from the survey result, 2020

Table 4: Marketing margin for different channels (Birr/qt)

| Actors  | Cost/profit item per quintal (Birr/quintal) | Marketing channel |
|---------|-------------------------------------------|-------------------|
|         | I  | II | III | IV | V  | VI | VII | X   | IX  |
| Producer| Cost of production | 145.59 | 145.59 | 145.59 | 145.59 | 145.59 | 145.59 | 145.59 | 145.59 |
|         | Selling price    | 900   | 853.31 | 853.31 | 833.33 | 833.33 | 833.33 | 800.50 | 800.50 |
|         | GMMpr            | 100   | 62.53% | 49.04% | 47.89% | 71.50% | 61.06% | 58.98% | 46.26% |
| Collector| Purchase price   | -    | -    | -    | -    | -    | -    | 800.50 | 800.50 |
|         | Selling price    | -    | -    | -    | -    | -    | -    | 978.00 | 978.00 |
|         | GMMc             | -    | -    | -    | -    | -    | -    | 12.68% | 9.94%  |
| Wholesaler| Purchase price  | -    | -    | -    | 833.33 | 833.33 | 833.33 | 978.00 | -     |
|          |                  |      |      |      |      |      |      |      |      |
|                | Selling price | -   | -   | 1165.5 | 1165.5 | 1165.5 | 1165.5 | -   | 1165.5 |
|----------------|---------------|-----|-----|---------|---------|---------|---------|-----|---------|
| **GMMw**       |               | -   | -   | 19.09%  | 28.50%  | 24.34%  | 13.70%  | -   | 10.75%  |
| **Retailer**   | **Purchase price** | -   | 853.31 | 853.31 | 1165.5 | 1165.5 | 978.00 | -   |         |
| **Selling price** | -             | 1364.74 | 1364.74 | -   | -   | 1364.74 | 1364.74 | -   |         |
| **GMMr**       |               | -   | 37.47% | 29.39% | -   | 14.60% | 14.60% | 22.23% | -   |
| **processor**  | **Purchase price** | -   | -   | 1364.74 | 1165.5 | -   | -   | -   | 1364.74 |
| **Selling price** | -             | -   | 1740 | 1740 | -   | -   | -   | 1740 | 1740 |
| **GMMp**       |               | -   | 21.67% | 33.02% | -   | -   | -   | 21.57% | 33.02% |
| **Consumer**   | **900**       | 1364.74 | 1740 | 1740 | 1165.5 | 1364.74 | 1364.74 | 1740 | 1740 |
| **TMGM**       | 0             | 37.47% | 51.06% | 52.11% | 28.50% | 34.95% | 41.02% | 53.74% | 53.74% |

Source: own computation from the survey result, 2020
3.3. Challenges and Opportunities in potato Value Chain

3.3.1. Opportunity analysis

Opportunity analysis for potato producers

According to the result obtained from the survey depicted in Table 5 shows that the main opportunity for potato producers was the availability of favorable climatic condition, availability of laborer, high market demand for potato product, presences of extension service, good government policy, access to market, availability of improved seed, having transport facility, having good value chain linkage in the study area, and having farmers’ cooperative were the opportunity for potato producing farmers from first rank to least rank.

Table 5 Opportunity analyses for sample potato producers

| Opportunity analysis for producers/farmers                                      | Percentage | Rank |
|--------------------------------------------------------------------------------|------------|------|
| Having farmers' cooperative                                                   | 33.17      | 10   |
| Good government policy                                                         | 67.82      | 5    |
| Availability of improved seed                                                  | 49.01      | 7    |
| Availability of laborer                                                        | 80.20      | 2    |
| Availability of favorable climatic condition                                  | 91.58      | 1    |
| Presences of extension service                                                 | 72.77      | 4    |
| High market demand for potato product                                          | 73.27      | 3    |
| Access to market                                                              | 57.43      | 6    |
| Having a transport facility                                                    | 48.51      | 8    |
| Having good value chain linkage in the study area                              | 43.56      | 9    |

Source: Own computation from the survey result, 2020

Opportunity analysis for potato traders

Table 6 shows that that the best opportunity for potato trading was the presence of demanders/customers for potato. Even some sample traders, especially retailers’ sample traders said that the study area currently is more urbanizing so this leads to a good opportunity for traders. Also, the survey result shows that availability of suppliers for potato products; good market centers’, having a market center is the best opportunity for potato trading, access to credit, having government support was an opportunity for potato value chain.
Table 6 Opportunity analyses for potato traders

| Opportunity analysis for sample traders | Percentage | Rank |
|----------------------------------------|------------|------|
| Good infrastructure                    | 51.4       | 4    |
| Availability suppliers for product     | 73.0       | 2    |
| Presence of customers for product      | 78.4       | 1    |
| Good market center                     | 62.2       | 3    |
| Access to credit                       | 27.0       | 5    |
| Having government support              | 24.3       | 6    |

Source: own computation from the survey result, 2020

Opportunity analysis for potato consumers

Opportunity analysis for the potato value chain in the consumer stage from sample respondents shows that the best opportunity for consumers was having high competitors between potato suppliers, good infrastructure, presence of suppliers, access to market information, increasing income source, and presences of a storage facility at home.

Table 7 Opportunity analyses for consumers

| Opportunity analysis for consumers | Frequency | Percent |
|-----------------------------------|-----------|---------|
| Storage facility at home          | 8         | 33.3    |
| Presences of suppliers            | 12        | 50.0    |
| High competitor b/n supplier      | 22        | 91.7    |
| Good infrastructure               | 17        | 70.8    |
| Increasing income source          | 10        | 41.7    |
| Access to market information      | 11        | 45.8    |

3.3.2. Constraints analysis

Constraints analysis for potato producers

According to the result obtained from the survey depicted in Table 8 that the main constraint for potato producing farmers was the improper supply of chemicals, disease and pest, Price fluctuation, Lack of technical training was one of the constraints for potato production,
Perishability, Shortage of rainfall problem in the study area, Poor linkage with value chain actor, Shortage of land, Seed supply and high post-harvest loss problems, and broker’s interference in price setting. In general, the major production constraints mentioned above were reported to be current problems in the production of potato in the focus group discussion made with model farmers and agricultural experts/representative agricultural extension workers in the study area.

Table 8 Constraints for potato producers

| Constraints analysis for producers/farmers | Percentage | Rank |
|------------------------------------------|------------|------|
| Shortage of rainfall                     | 64.37      | 6    |
| Disease and pest                         | 88.12      | 2    |
| Lack of technical training               | 77.14      | 4    |
| Shortage of land                         | 51.98      | 8    |
| Chemical supply                          | 95.05      | 1    |
| Seed supply                              | 47.03      | 9    |
| High post-harvest loss                   | 47.03      | 9    |
| Price fluctuation                        | 77.23      | 3    |
| Perishability                            | 66.34      | 5    |
| Lack of market                           | 37.67      | 10   |
| Poor linkage with value chain actor      | 54.95      | 7    |
| Brokers interference in price setting    | 37.67      | 10   |

Source: own computation from the survey result, 2020

Constraints analysis for potato traders

Regarding, potato value chain constraints in the traders’ stage; sample traders respond that the worst constraints in the trading stage were seasonal price variations, the perishability of potatoes product, Lack of integration among chain actors, lack of market information, fluctuation of demanders, lack of credit access, and low supply of potato were potato market constraints for potato traders.

Table 9 Constraints analysis for potato traders
| Constraints at traders level                                      | Percentages | Rank |
|------------------------------------------------------------------|-------------|------|
| Lack of integration among chain actors                           | 67.6        | 3    |
| Lack of credit access                                            | 51.4        | 6    |
| Lack of market information                                       | 59.5        | 4    |
| Perishability                                                    | 86.5        | 2    |
| Low supply of potato                                             | 32.4        | 7    |
| Lack of demand                                                   | 54.1        | 5    |
| Seasonal price variations                                        | 100.0       | 1    |

Source: Own computation from the survey result, 2020

Constraints analysis for potato consumers

Potato value chain constraints at consumers’ stage as data get from sample consumer respondents show that the worst constraints for potato consumers were increasing urbanization. From total consumer respondents, increasing urbanization from time to time, price fluctuation from season to season even day today, perishability, poor product handling, income shortage, lack of market information, supply shortage, and lack of storage at home.

Table 10 Constraints analysis for potato consumers

| Constraints at consumers stage                                | Frequency | Percentages | Rank |
|--------------------------------------------------------------|-----------|-------------|------|
| Perishability                                                | 18        | 75.0        | 3    |
| Lack of market information                                   | 11        | 45.8        | 5    |
| Urbanization                                                 | 21        | 87.5        | 1    |
| Poor product handling                                        | 6         | 25.0        | 7    |
| Price fluctuation                                            | 20        | 83.3        | 2    |
| Lack of storage at home                                      | 10        | 41.7        | 6    |
| Income shortage                                              | 14        | 58.3        | 4    |
| Supply shortage                                              | 11        | 45.8        | 5    |
4. Conclusion and Recommendations

The main objective of the study was to analyze the potato value chain in the case of Lemo woreda, Hadiya zone, southern Ethiopia. For this research work, survey data were carried out in the 2019/2020 cropping season on a total of 202 farm households that randomly drowned from three kebeles. Depending on the roles and number of value chain actors, representative samples were also drawn from 37 traders and 24 consumers, to generate the required data. The survey data were analyzed using descriptive statistics. The main findings of this research are summarized as follows.

Potato value chain analysis in the study areas revealed that the main value chain actors are input suppliers, potato farmers, collectors, wholesalers, retailers, processors, and consumers. Each actor adds value to their product in form of the place, time, form, and possession utility. Credit agencies, business service providers, government, NGOs, cooperatives, researchers, extension agents, and the like were value chain enablers in the study area. According to survey findings, the largest share of potato products sold through channel VI (Potato producers ➔ Wholesalers ➔ Retailers ➔ Consumers).

Regarding the marketing margin of the chain actors, Potato producers in the study area had a maximum gross margin of 100% and a minimum gross margin of 54.63%. The maximum share is due to the absence of intervention of any intermediaries who could reduce the share of potato producers.

This study reveals that there are constraints and opportunities for potato value. The overall potato value chains are constrained by several factors that hinder the development of the potato value chain. At the farm level, the major production constraints are a shortage of rainfall, potatoes’ disease and pest, lack of technical training, shortage of land, chemical supply, seed supply, high post-harvest loss, price fluctuation, perishability, lack of market, poor linkage with value chain actor and brokers’ interference in price setting. At the marketing/trading stage lack of integration among chain actors, lack of credit access, lack of market information, perishability, low supply of potato, lack of demand, and seasonal price variations. Also at the consumption level, the potato value chain constraints face in study areas like perishability, lack of market information, urbanization, and poor product handling, and price fluctuation, lack of storage at home, income shortage, and supply shortage. And on the other hand, there is also the opportunity for that potato value chain actors’ at different stages. The opportunities at production stages are having farmers' cooperative, good government policy, availability of improved seed, availability of laborer, availability of favorable climatic condition, presences of extension service, presence of credit service, high market demand for potato product, access to market, having transport facility and having good value chain linkage in the study area. The opportunities at trader stages are good infrastructure, availability suppliers for a product, presence of customers for the product, good market center, access to credit, and having government support. And the opportunities at
consumer stages are storage facility at home, presence of suppliers, high competitor b/n supplier, good infrastructure, increasing income source, and access to market information.

The findings of this study enabled us to make the following recommendations for policymakers, development actors, and researchers who have a strong interest in promoting potatoes production and marketing for equal benefits among value chain actors.

There is a gap in the effective and efficient linkage between value chain actors. Therefore, redefining and integrating the existing concerns of the government, the private sector, and public institutions in promoting the development of the potato value chain should be required.

In the study area, there is a different opportunity and constraint in potato value chain activities. So, to make value chain actors more productive and profitable, inspiring them to use good opportunity through overcoming constraints is much recommended.

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