

Value chain analysis of Potato in Dedo district of Jimma zone, Ethiopia

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Abstract: Potato is number one non-grain food commodity of the world. Even though, Ethiopia has favorable ecology, the production of potato is characterized by poor seed quality, low skills of farmers, diseases, high post-harvest losses and poor organization along chain. The study is aimed to identify potato value chain actors and their roles and analyze marketing margins for actor. For this study 136 potato producers were randomly selected, 5wholesalers, 8collectors, 12 retailers and 6 small scale processors were purposively selected. Quantitative and qualitative data were collected from primary and secondary sources. Descriptive statistics was used to analyze data, chain mapping was implemented to identify actors and their supply linkage. Margin analysis was used to estimate value gained by each actors involved in potato value chain. The identified actors were input suppliers, producers, wholesalers, retailers, small scale processors and consumers. Supporting actors were office of agriculture, irrigation, micro finance, cooperatives, trade and market development, NGOs and bank. The margin analysis revealed that 65.01%, 12.29%, 9.78%, 8.27%, 3.27% share of margin goes to small scale potato processors, potato producers, retailers, wholesalers and collectors respectively. The major constraints were high price of seed, poor infrastructure, interferences of brokers, low storage facilities, weak linkage, disease and pests. The opportunities were suitable agro-ecology and government support. Strengthening the linkage among actors, providing training on storage construction and disease control, improving bargaining power of producers and initiate small scale processors were recommended to improve potato value chain.

Key Words: Value chain analysis, potato, constraints and opportunities.

I. INTRODUCTION

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

Since value chain is a key framework for understanding how a product moves from the producer to the end user, provides an important means to understand the actor's relationships, mechanisms for increasing efficiency, and ways to increase productivity and add value. It is also a vehicle for pro-poor initiatives and for linking small business with the market (Webber and Labaste, 2009). Therefore, this study was initiated to conduct value chain analysis of potato in the study area, with the particular objective of mapping potato value chain, identify actors and their roles, analyze marketing margins of actors, point out major constraints and opportunities of potato value chain in Dedo district of Jimma zone, southwest Ethiopia.

II. METHODOLOGY

Description of the Study Area

The study was undertaken in Dedo district which is one of 22 districts of Jimma zone, Southwest Ethiopia, located at a distance of 377 km from Addis Ababa, it is bordered with Kersa district in the north, Omo Nada district in east, SNNP regional state district in the south and Seka Chokersa district in west.

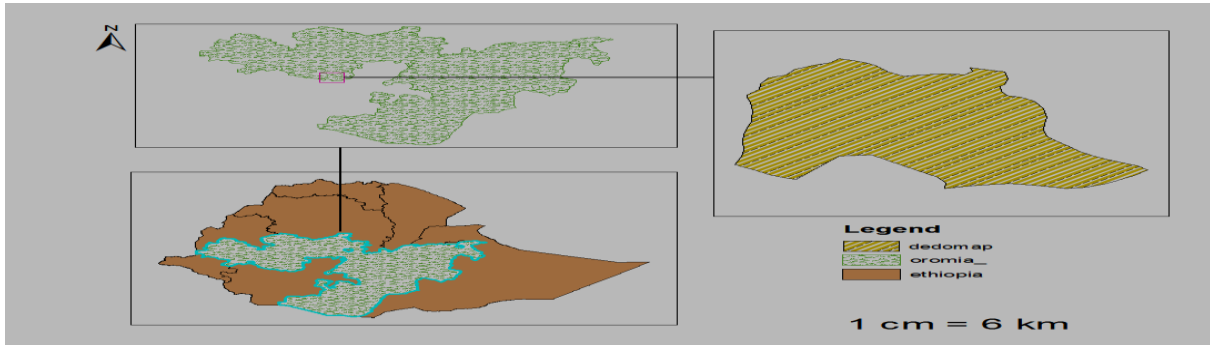


Figure 1. Map of the Study area

Data Types, Sources and Methods of Data Collection

For this study both quantitative and qualitative data types were collected, sources of primary data were potato producer (farmers), traders and small scale processors. Besides the primary data, secondary data was obtained from published and unpublished sources. Primary data was collected through interview schedule containing close ended and open ended question. Key informant interview with experts of different concerned organization was conducted to collect necessary. Focus group discussion consists of male and female, literate and illiterate were held.

Sampling Procedure and Sample Size Determination

Farmers sampling

Out of the 53 rural *kebeles* in Dedo district 20 *kebeles*¹were producers of potato. Out of the 20 potato producing *kebeles*, 4 of them were randomly selected. Then, 136 sample farmers were selected randomly based on proportional to the population size of the selected *kebeles*. Yamane (1967) sample size determination formula was used to calculate sample size.

$$n = \frac{N}{1+N*(e^2)} \text{-----(1)}$$

Where: - n -the sample size N - Potato producers e - the acceptable sampling error

$$N = 1070, n \approx 136 \ \& \ e = 8\%$$

Traders sampling

Sample size of traders included in the study were obtained in different ways, wholesalers included in the study based on information obtained from Dedo district office of trade and market development, there were 5 joint vegetables wholesalers in the district and all of them were included as they all participated in wholesale business of potato. According to district trade and market development office collectors, retailers and small scale processors in the area is not licensed, because of this, information about number of collectors was obtained from wholesalers. Based on these 8 collectors were included in the study. Likewise 12 retailers out of 24 and 6 small scale processors were interviewed.

III. Method of Data Analysis

In this study, descriptive methods were employed in analyzing data from the survey. Descriptive statistics were used to describe different characteristics of the sample households. Value chain mapping was used to identify the chain actors and their supply linkage. Margin analysis was used to estimate value gained by each actors involved along potato value chain.

¹A kebele is the lowest level in Ethiopian formal administrative structure which is next to district

$$\text{Gross Margin} = \text{Sales price (SP)} - \text{Purchase price (PP)} \quad \text{---2}$$

$$\text{Marketing profit (MP)} = \text{Gross margin (GM)} - \text{Marketing cost (MC)} \quad \text{---3}$$

IV. RESULTS AND DISCUSSION

This chapter deals with the socioeconomic and demographic characteristics of potato value chain actors, their core functions and linkage are discussed in detail. The chapter also deals with the analysis of marketing margin of actors, and major constraints and opportunities in potato value chain.

Table 1: Demographic and socio economic characteristics of sample farmers and traders

Variables	Mean /percentage				
	Producers	Collectors	Wholesalers	Retailers	Small scale processor
Sex (Male)	91.18	87.50	80	40	0
Age	48.38	33.25	44.6	41.6	31.67
Educational level	3.10	3.125	6	2.46	0.834
Farming /Trading experience	19.96	3.375	7.8	6.26	2.17
Family size	7.73	1.68	7.81	5	2.96
Initial Capital	-	1300	8010	730	-
Current Capital	-	7562.5	74000	4753.4	-

Source: Own computation of survey data (2016).

Results of Value Chain Analysis

Value chain can be mapped and analyzed using value chain analysis (VCA). The first step of a value chain analysis is mapping. A mapped value chain includes the actors, their relationships, and economic activities at each stage (Fafse *et al.*, 2009). Mapping value chain helps to identify the different actors involved in potato value chain, and to understand their roles and linkages. The value chain map of potato is described on figure 2, the figure shows actors involved and activities performed in stages of the value chain.

The actors identified in potato value chain in study area were input suppliers, producers, collectors, wholesalers, retailers, small scale processors and consumers. These are actors engaging directly in different value chain functions. The main supporting actors identified were DoANR, DoIA², DoTMD³, micro finance institutions (*i.e* OCSI⁴ & ESHET), cooperatives promotion office, NGOs and Bank.

²District office of irrigation authority

³ District office of trade and market development

⁴ Oromia credit and saving institution

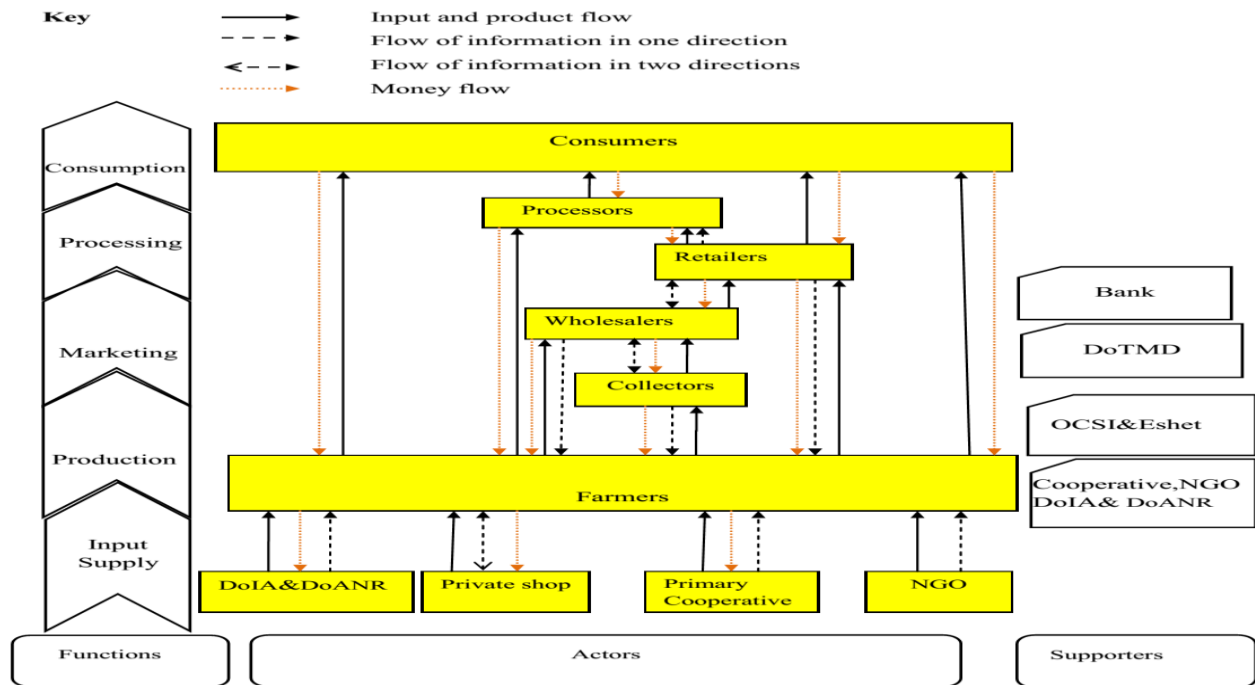


Figure 3. Potato value chain map

Source: Own sketch from survey result, 2016.

Results of Margin Analysis

The marketing margin is the difference between the price paid by the ultimate consumer and the price received by the producer. The number of intermediates involved in various channels of the marketing has a strong effect on the marketing margin.

Table 2: Average production and marketing costs of potato for different actors (Birr/Qt)

Cost items	Cost incurred per quintal by actors				
	Producers	Collectors	Wholesalers	Retailers	Processors
Cost of seed/tuber	68.65	-	-	-	-
Cost of fertilizer	26.21	-	-	-	-
Cost of chemicals	6.76	-	-	-	-
Packing cost	14.5	13.2	13.2	35	167
Labor cost	35.44	3.37	4.20	3.933	5
Transport	10	15.50	13.6	6.06	6.83
Storage cost	-	-	2.1	-	-
Product loss	23.3	9.12	17.80	13.10	5.66
Tax /Charge	-	-	3	-	-
Brokerage	-	-	2.40	-	-
Processing cost	-	-	-	-	300
Other Expense	11.28	12.87	5.66	6.67	6.66
Total cost	196.14	54.06	61.96	64.76	491.16

Source: Own computation of survey data (2016).

The major production costs incurred by potato producer were seed/tuber, fertilizer, chemicals and labor cost Table: 2. The highest cost items incurred by producers was the cost of seed for potato production with an average of birr 68.65 for producing a quintal of potato in study area. The cost incurred by processors was 491.16birr/quintal which was the

highest marketing cost this is due to skyrocketing price of oil and other necessary ingredients for processing potato into cooked and chips.

Table: 3Analysis of margin distribution along potato value chain

Cost/quintal	Actors along potato value chain					
	Producers	Collectors	Wholesalers	Retailers	Processors	Horizontal summation
Production cost	137.06	-	-	-	-	137.06
Purchase price	-	295.80	346.20	430.25	560.63	1632.88
Marketing cost	59.08	54.06	61.96	64.76	491.16	731.02
Selling price	358.93	385.00	497.00	600.00	1734.00	3574.93
Marketing margin	221.87	89.20	150.80	169.75	1173.38	1804.99
%Share of margins	12.29	4.94	8.35	9.40	65.01	99.99
Profit margins	162.79	35.14	88.84	104.99	682.22	1073.97
%Share of profit	15.16	3.27	8.27	9.78	63.52	100

Source: Own Computation from Actors survey data (2016)

According to the result of margin analysis for actors involved in potato value chain specify that around 65.01% and 63.52 % of market margin and profit margin respectively, was captured by small scale potato processors. Next to processors about 12.29% and 15.16 % of marketing margin and profit margin respectively, obtained by farmers. The rest actors (retailers, wholesalers and collectors) gets marketing margin of 9.40 % ,8.35% &4.94% and profit margins of 9.78 %, 8.27 %&3.27% respectively in the potato value chain.

Constraints and Opportunities in Potato Value Chain

There are factors that hinder potato value chain in study area. The issues rose on focus group discussion and key informants interview was summarized on 3. The major constraints which hold back the development of the potato value chain and opportunities along potato value chain were identified through focus group discussion and key informant interview were summarized as follows.

Table 3: Summary of constraints and opportunities in potato value chain

V. Chain stages	Constraints	Opportunities
Input supply	Limited access to improved potato seed High cost of inputs (<i>i.e</i> fertilizer ,pesticides and herbicides) In adequate supply of pesticides and fungicide	Demand for improved seed Some support from GO and NGO's
Production	In adequate agronomic practices by farmers Prevalence of diseases and pests Poor storage facility High post-harvest loss Weak traditions of irrigation use	Favorable agro-ecology Availability of irrigable land Availability of labor
Trading/marketing	Low price of potato at harvest Price fluctuation Brokers interference in price setting Poor storage facility and infrastructure	Raising demand for potato
Processing	Lack of processing facility High cost of ingredient Conventional way of potato processing	Low price of potato Profitability of potato processing Availability of potato
Consumption	Traditional ways of potato preparation at home Income shortage High price of product (when intermediates number is large) Poor storage facility	Availability of potato on market

Source: Own summary from Focus group discussion and Key informant interview (2016).

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary and Conclusion

This study aimed at conducting value chain analysis of potato in Dedo district of Jimma zone southwest Ethiopia. With specific objectives of mapping potato value chain, identify actors and their function; analyze marketing margins of actors in potato value chain, identifying major constraints and opportunities of potato value chain.

Both quantitative and qualitative data was collected from Primary and Secondary sources, Interview (interview schedule containing close ended and open ended question), key informant interviews and Focus group discussion was held.

Out of 53 rural administrative *kebeles* in Dedo district, potato produced in 20 *kebeles*, out of these 4 *kebeles* were selected randomly, then 136 potato producers were selected randomly. Regarding traders sampling 5 wholesalers, 8 collectors, 12 retailers and 6 small scale processors were selected purposively. In this study descriptive and econometric methods of data analysis were used to analyze data from producer's survey.

The major actors identified in potato value chain in study area were input suppliers, producers, wholesalers, retailers, small scale processors and consumers. Key supporters of potato value chain in the study area were district office of agriculture and natural resources, irrigation authority office, trade and market development office, cooperative promotion office, Oromia credit and saving institution, Eshet microfinance, NGO's and bank. Different actors involved in potato value chain in study area, however there is a weak link among actors in potato value chain.

The result of margin analysis for actors involved in potato value chain indicates about 65.01% and 63.52 % of market margin and profit margin respectively, was captured by potato processors. Next to processors about 12.29% and 15.16 % of marketing margin and profit margin respectively, is obtained by farmers. Retailers, wholesalers and collectors obtained marketing margin of 9.40 %, 8.35% and 4.94%, and profit margins of 9.78 %, 8.27 % and 3.27% respectively.

The results indicated that farmers those directly sold to consumers obtained highest marketing margin, this is due to absence of intermediary.

The major constraints identified were high price of improved seed, poor infrastructure (i.e road and telecommunication) interferences of brokers, low storage facilities, poor linkages with other actors in the chain, prevalence of disease and pests and parish ability of the product. From this we deduct that producers in study area is facing with huge production and marketing problem.

Recommendations

Based on the findings of the study, the following recommendation is forwarded.

1. Strengthening the linkage/interaction among value chain actors helps for better performance of potato value chain in the study area.
2. Capacitating small scale processors through providing them with processing equipment.
3. Provide training on seed potato storage construction, disease and pest control and vegetable crops management helps to solve seed problem.
4. Encouraging legal potato traders and create awareness for illegal traders to collect them into formal potato trade system.
5. Improve bargaining power of potato producers through establishing potato producer's cooperatives.
6. Improving infrastructures (road and telecommunications) of rural village by constructing all weather road and enlarge network coverage to enhance market access of producers.

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