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Value Chain Analysis of Haricot Bean in East Shewa Zone, Oromia Regional State, Ethiopia

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Abstract

The key objectives of the study were identifying haricot bean value chain actors, their functions and relationship among them, examining actor's performance along the chain and analyzing factors affecting supply to the market and factors affecting market outlet choice in the study area. Both primary and secondary sources were used for data collection. The primary data was collected through interviewing 180 sample household farmers and 40 traders using semi-structured questionnaires. STATA version 15 Software was used for data analyzing. As the descriptive result indicate that, on average farmers allocate 0.72ha of land for haricot bean production, from which 21.72qt/ha of output gained. In the value chain of haricot bean input suppliers, farmers, collectors, traders, transporters and consumers are the major value chain actors who perform various value chain. From the study result, six marketing channels of haricot bean are exhibited in the study areas. Estimates of the multiple linear regression models indicate that the level of haricot bean supplied to the market is determined by educational level of household, haricot bean farming experience, land allocated for haricot bean, market price of haricot bean, TLU, access to credit, and access to market information. Therefore, policy makers should focus more on the abovementioned variables in the future intervention to increase volume of haricot bean supplied to the market. As the multivariate probit model result indicated that the market outlet choice of rural assemblers was positively and significantly influenced by distance to the nearest market center, distance to all weather road, and educational level whereas it's negatively and significantly influenced by output level where as selling direct to consumers outlet choice was negatively and significantly affected by sex of household, educational level, farm experience of household in haricot bean, and output level. Urban traders/wholesalers market outlet was positively and significantly affected by sex of household, educational level, haricot bean farm experience, access to credit, access to market information, membership of

cooperative, and output level whereas it's negatively influenced by distance to the nearest market center, distance to all weather road and extension service. Based on the findings of this study, some relevant implications can be drawn that can assist to design appropriate intervention mechanisms to improve market outlets choice of haricot bean farmers in the study area.

Keywords: Haricot bean, value chain, market outlet choice, market channel and margin.

1. Introduction

1.1 Background and Justification

Ethiopia is known as the homeland of several crop plants. It is ranked 13 among pulse producing countries in the world (FAO, 2015). Pulses play crucial economic, and food and nutrition security roles, in Ethiopia. According to CSA 2016 report the country planted on 1.47 million hectare and produced 2,620,530 tons in 2016. Haricot bean (*Phaseolus vulgaris L.*) has been an export pulse crop for more than 50 years and probably been grown as food crop for a much longer period in the low and midland altitude areas of the country (Ferris and Kaganzi, 2008). Agricultural marketing is the main driving force for economic development and has a guiding and stimulating impact on the production and distribution of agricultural produce. However, the marketing of haricot bean at the local level was largely carried out by smallholder farmers and traders that face many socio- economic challenges along the marketing channel (Yaynabeba & Tewodros, 2013; FAO, 2015).

Despite the nutritional and economic importance of haricot bean in Adami Tulu Jido Kombolcha and Dugda Districts, various outcomes such as low productivity, erratic rainfall, post-harvest loss and price fluctuations contribute for the value chain inefficiency and also influenced the supply of the product to the market (WoANR, 2022). However, the evidence base regarding value chain actors, functions, profit margin distribution, and factors that affect producers to supply haricot bean to the market is scanty. Nevertheless, the determinants of haricot bean supply to the market are given less attention in the study area. Thus, a detailed investigation is required to identify problems prevailed in the haricot bean value chain. Therefore, by considering the existing knowledge gap this research was intended to address the limitations of the existing few studies by comprehensively investigating the role and interaction of various haricot bean value chain actors, benefit share along channels and identify factors that affect supply of haricot bean to the market. With this thrust, the study aimed to contribute to the growing literature in value chain analysis and market supply.

1.2 Objectives of the Study

The specific objectives of the study are:

- To identify haricot bean value chain actors and their value share, supporters and their functions
- To Map haricot bean value chain
- To identify market channel of haricot bean

- To analyze factors affecting haricot bean supply to the market
- To analyze factors affecting haricot bean outlet choose

2. Research Methodology

This study was conducted in ATJK and Dugda districts, East Shewa zone of Oromia National Regional State, Ethiopia.

2.1 Data Types, Sources and Methods of Data Collection

Both primary and secondary data was used for this study. The questionnaire was designed and pre-tested in the field for its validity and content, and to make overall improvement of the same and in line with the objectives of the study. Secondary data relevant for this study was also gathered from ATJK district office of agriculture, CSA, and from published and unpublished sources.

2.2 Sampling Procedure and Sample Size

A multi-stage sampling procedure was used to identify sample households for data collection. In the *first stage*, haricot bean producer *districts* were purposively identified based on the potential of production and markets. The *second stage*, haricot bean producer *kebeles* were purposively identified based on the potential of haricot bean production and markets i.e. four and three haricot bean producing *kebeles were selected from ATJK and Dugda districts, respectively*. In the *third stage*, 180 haricot bean producer households were randomly selected from the total haricot bean producer households in the districts using Yamane (1967) sample size determination as follows:

$$n = \frac{N}{1 + N(e)2}$$

Where: n = is the sample of haricot bean producer households in the districts N = is the total haricot bean producer in the districts and e = 0.08 is the level of precision defined to determine the required sample size at 92% level of precision. On the basis of flow of haricot bean, ATJK were selected as, the main haricot bean marketing sites for the study areas, hence a purposive sampling method was used to select wholesalers, rural collectors and retailers from specified markets.

2.3 Method of Data Analysis

Descriptive statistics and econometric model were used for analyzing the data. A multiple linear regression model was used to analyze factors affecting supply of haricot bean to the market whereas Multivariate probit was used to analyze factors affecting market outlet choice.

3. Result and Discussion

3.1 Demographic Characteristics of Sampled Households for the Study Area

The average age of the sample households during the survey period, was about 38.24 years having general farming and haricot bean experience 17.28 and 7.24 years, respectively. The average education level of literate sample household heads during survey period was about 7.089 years. Family size plays an important role in crop production and most farmers depend mainly on family labor. The average family size of the sample households was 8 persons per household (Table 1) which is greater than 4.6 persons per household as Ethiopia, based on household size and composition around the world in 2017. On average the sample respondents allocated 0.72ha of land for haricot bean production from 2.286 ha of total cultivated farmland in the study area. On average, sample household owned livestock of 7.54 TLU.

Table 1. Socio-demographic characteristics of sample respondents in the study area

Demographic Characteristics	Total Sample (n=180)	
	Mean	Std. Dev
Age of HH head	38.24	10.96
Farm Experience	17.28	11.32
Experience in HB Production	7.24	5.23
Family size	8	3.39
TLU	7.54	5.09
Grade level	7.09	2.84
Land allocated for HB	0.72	0.44
Cultivated land	2.29	1.88
Total land holding	2.82	1.41
Distance to local market	1.89	2.07
Distance to nearest market Center	8.23	4.76

Source: Survey result of 2022.

3.2 Regression Analysis

3.2.1 Determinants of Volume of Haricot Bean Supplied to the Market

In this section, the selected explanatory variables were used to understand the determinants of volume of haricot bean supplied to market. As depicted in Table 2, the model was statistically

significant at 1% probability level indicating the goodness of fit of the model to explain the relationships of the hypothesized variables. R^2 indicates that 82 percent of the variation in the quantity of haricot bean supplied to market was explained by the variables included in the model.

Table 2. Determinants of volume of haricot bean supplied to the market (OLS estimate)

Variable	**Coefficients**	**Std. Err.**	**P>t**
Age of HH	0.054	0.008	0.842
Sex of HH	0.319	0.421	0.535
Education level of HH	0.420*	0.300	0.093
HB Farm experience	0.332**	0.231	0.018
Family Size	0.621	0.423	0.568
Distance to the nearest market Center	-0.148**	0.062	0.038
Land allocated for HB	7.329***	1.774	0.000
Market price of HB	12.17***	2.102	0.000
TLU	0.252*	0.092	0.091
Access to extension	0.465	0.322	0.148
Access to credit	0.833*	0.477	0.081
Participation in off/non-farm activity	-0.951**	0.4612	0.039
Access to market information	1.893***	0.429	0.000
Constant	2.60*	0.790	0.079
Number of Observation 180			
F(13, 166) 42.23			
Prob>F 0.0000***			
R-Squared 0.820			

Note. Dependent variable is quantity of haricot bean supplied to market in quintal in 2022.

***, ** and * are Significant at 1%, 5% and 10% level of probability, respectively.

The result shows that land allocated for haricot bean has significant effect on volume of haricot bean supplied to the market at 1% significant level with expected positive sign. Increase in the size of one hectare of land allocated for haricot bean increases volume of sales of haricot bean by 7.33 quintal, keeping other factors constant. This result is in line with the findings of (Toyiba et al., 2014; Beriso, 2018).

Education has showed positive effect on haricot bean quantity supplied to market with significance level at10%. The survey results revealed that, if haricot bean producer gets educated, the amount of haricot bean supplied to the market increases by 0.42 quintal, keeping other factors constant. This may be because majority of the farmers in the study area have minimum education requirements to make them market oriented and thus enable them to have better skills and better access to information to supply more haricot bean to market. This result was similar with the study of Amare (2013).

Haricot bean farming experience of households has significant effect at 5% significant level for haricot bean quantity sold with expected positive sign. Thus, the result implied that, as farmers experience increase by one year, the haricot bean supplied to market increased by 0.332 quintal, keeping others factors constant. This means that the farmers with more experience in haricot bean production and marketing have higher ability to sell more haricot bean produces in the market than less experience because they have more marketing network and information.

Market price of haricot bean influenced the volume of sale positively at 1% level of statistical significance with expected positive sign. This result shows that one ETB increase in haricot bean price increase the volume of haricot bean supplied to the market by 12.17 quintal, keeping other factors constant. This suggested that farmers are more response to higher prices because they get higher incomes from their produce. This result is in line with the findings of (Sebatta et al., 2014; Sigei et al., 2014).

Owning more numbers of livestock had a positive influence on the level of haricot bean sale at 10% level of statistical significance. This implies that an additional of livestock in TLU would increase the extent of haricot bean sells by 0.252 quintals, keeping other factors constant. Households with higher livestock possession would lead to higher probability of getting excess livestock for selling to purchase inputs for production particularly the owner of more oxen have an ability of ploughing more land on time, thereby achieving crop yields which increase the marketable surpluses. Some livestock (donkey and horse) also used for transporting haricot bean products to market which reduces transportation costs. This result is in line with the findings of (Aman et al., 2013).

Access to credit had a positive impact on the extent of haricot bean sells at 10% significance level. This indicated that the more household access to credit the extent of haricot bean offered for sells would increase by 0.833 quintals, *ceterus peribus*. Access to market information had a positive impact on the extent of haricot bean sells at 1% significance level. This indicated that the more household access to market information the extent of haricot bean offered for sells would increase by 0.833 quintals, *ceterus peribus*. This result implies that market information availability motivated households to sell more Haricot bean produces

since it informs the farmers about market. This result is in line with the findings of (Gani & Adeoti, 2011).

Participation in off/non-farm activities had a negative impact on the volume of haricot bean supplied to the market at 5% level of statistical significance. This implies that the respondents' involvement in off/non-farm activities would decrease the extent of haricot bean sells by about 0.951 quintals, keeping other factors constant.

Distance from the nearest market affects haricot bean supply negatively and significantly at less than 5% significance level. Consistent with theory and empirical evidence, the result shows that as the distance from the nearest market increases by 1 kilometer, the quantity of haricot bean supplied decreases by 0.148 quintals. This might be due to increase in associated transportation costs that will increase with distance to markets.

3.2.2 Factors Affecting Smallholder Haricot Bean Producers Market Outlet Choices

The model results in Table 3, reveals the choice set in the MVP model includes three outlet choices; which were rural assemblers', urban traders', and direct consumers outlet. The matrix rho, rho was represented the correlation coefficient matrix between rural assemblers, and direct consumers, rural assemblers and urban traders and direct consumers and urban traders, respectively. The likelihood ratio test result indicated that, the correlation coefficients are statistically different from zero in one of the three cases, verifying the goodness of fit of the multivariate probit model and outlet choices are mutually interdependent. The Wald $\chi 2$ test value of 79.25 which is significant at 1% significance level reveals separate estimation of choice of these outlets is biased and the decisions to choose the three outlets were interdependent. Table 3, further reveals that the probability of choosing rural assembler, direct to consumer and wholesaler of haricot bean producers were 41.5%, 24.6% and 60.6%, respectively. The joint probability of choosing all market outlets was 0.5% and whereas the probability of a failure to jointly choose was 2.7%.

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Table 3. Factors affecting market outlet choices of smallholder haricot bean producers

Variables 1.1.1.1.1	1.1.1.1.3 **Rural assemblers**		1.1.1.1.4 **Direct consumers**		**1.1.1.1.5 Wholesalers**	
	1.1.1.1.7 **Coef.**	1.1.1.1.8 **R. std.**	1.1.1.1.9 **Coef.**	1.1.1.1.10 **R. std.**	1.1.1.1.11 **Coef.**	1.1.1.1.12 **R. std.**
1.1.1.1.13 Age of household heads	1.1.1.1.15 0.210	1.1.1.1.16 0.027	1.1.1.1.17 0.006	1.1.1.1.18 0.018	1.1.1.1.19 0.008	1.1.1.1.20 0.020
1.1.1.1.21 Sex of household heads	1.1.1.1.23 -0.566	1.1.1.1.24 0.514	1.1.1.1.25 -0.706**	1.1.1.1.26 0.323	1.1.1.1.27 1.487***	1.1.1.1.28 0.378
1.1.1.1.29 Educational level	1.1.1.1.31 0.140**	1.1.1.1.32 0.063	1.1.1.1.33 -0.101**	1.1.1.1.34 0.040	1.1.1.1.35 0.074*	1.1.1.1.36 0.042
1.1.1.1.37 Farm experience	1.1.1.1.39 -0.410	1.1.1.1.40 0.621	1.1.1.1.41 -0.709*	1.1.1.1.42 0 .406	1.1.1.1.43 0.709*	1.1.1.1.44 0.406
1.1.1.1.45 Access to price information	1.1.1.1.47 -0.442	1.1.1.1.48 0.272	1.1.1.1.49 -0.340	1.1.1.1.50 0.421	1.1.1.1.51 1.017***	1.1.1.1.52 0.386
1.1.1.1.53 Membership in Cooperatives	1.1.1.1.55 -0.467	1.1.1.1.56 0.413	1.1.1.1.57 -0.264	1.1.1.1.58 0.462	1.1.1.1.59 1.039***	1.1.1.1.60 0.397
1.1.1.1.61 Use of Credit	1.1.1.1.63 -0.422*	1.1.1.1.64 -0.491	1.1.1.1.65 0.420	1.1.1.1.66 0.489	1.1.1.1.67 0.872**	1.1.1.1.68 0.473
1.1.1.1.69 Dist. to the nearest district market	1.1.1.1.71 0.240***	1.1.1.1.72 0.062	1.1.1.1.73 -0.066	1.1.1.1.74 0.040	1.1.1.1.75 -0.082***	1.1.1.1.76 0.028
1.1.1.1.77 Distance to all weather road	1.1.1.1.79 0.264**	1.1.1.1.80 0.072	1.1.1.1.81 -0.002	1.1.1.1.82 0.058	1.1.1.1.83 -0.006	1.1.1.1.84 0.062
1.1.1.1.85 lnPRod/output level	1.1.1.1.87 -5.55***	1.1.1.1.88 0.997	1.1.1.1.89 -2.505***	1.1.1.1.90 0.621	1.1.1.1.91 2.505***	1.1.1.1.92 0.621
1.1.1.1.93 Extension	1.1.1.1.95 1.615	1.1.1.1.96 1.615	1.1.1.1.97 0.084	1.1.1.1.98 0.084	1.1.1.1.99 -0.084	1.1.1.1.100 -0.084
1.1.1.1.101 Constant	1.1.1.1.103 17.61***	1.1.1.1.104 4.687	1.1.1.1.105 10.425***	1.1.1.1.106 3.904	1.1.1.1.107 -10.425***	1.1.1.1.108 3.904
1.1.1.1.109 Predicted probability	1.1.1.1.111 0.415	1.1.1.1.112	1.1.1.1.113 0.246	1.1.1.1.114	1.1.1.1.115 0.606	1.1.1.1.116
1.1.1.1.117 Joint probability of success	**1.1.1.1.119**	**1.1.1.1.120**	**1.1.1.1.121**	**1.1.1.1.122**	**1.1.1.1.123** 0.005	**1.1.1.1.124**
1.1.1.1.125 Joint probability of failure	**1.1.1.1.127**	**1.1.1.1.128**	**1.1.1.1.129**	**1.1.1.1.130**	**1.1.1.1.131** 0.027	**1.1.1.1.132**

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1.1.1.1.133	**1.1.1.1.134** *Multivariate probit (MSL, # draws)*				1.1.1.1.135 100	**1.1.1.1.136**
1.1.1.1.137 Number of observations	**1.1.1.1.139**	**1.1.1.1.140**	**1.1.1.1.141**	**1.1.1.1.142**	1.1.1.1.143 180	**1.1.1.1.144**
1.1.1.1.145 Log likelihood	**1.1.1.1.147**	**1.1.1.1.148**	**1.1.1.1.149**	**1.1.1.1.150**	1.1.1.1.151 -155.320	**1.1.1.1.152**
1.1.1.1.153 Wald(χ2(11)	**1.1.1.1.155**	**1.1.1.1.156**	**1.1.1.1.157**	**1.1.1.1.158**	1.1.1.1.159 3299.71	**1.1.1.1.160**
1.1.1.1.161 Prob > χ2	**1.1.1.1.163**	**1.1.1.1.164**	**1.1.1.1.165**	**1.1.1.1.166**	1.1.1.1.167 0.0000***	**1.1.1.1.168**
1.1.1.1.169 Correlation matrix	*1.1.1.1.171*	*1.1.1.1.172 ρ1(Y1)*	*1.1.1.1.173*	*1.1.1.1.174 ρ2(Y2)*	*1.1.1.1.175*	*1.1.1.1.176 ρ3(Y3)*
1.1.1.1.177 ρ1(Y1)	*1.1.1.1.179*	*1.1.1.1.180 1*	*1.1.1.1.181*	*1.1.1.1.182*	*1.1.1.1.183*	*1.1.1.1.184*
1.1.1.1.185 ρ2(Y2)	*1.1.1.1.187*	*1.1.1.1.188 0.025*	*1.1.1.1.189*	*1.1.1.1.190 1*	*1.1.1.1.191*	*1.1.1.1.192*
1.1.1.1.193 ρ3(Y3)	*1.1.1.1.195*	*1.1.1.1.196 -0.224***	*1.1.1.1.197*	*1.1.1.1.198 -0.756****	*1.1.1.1.199*	*1.1.1.1.200 1*
1.1.1.1.201	**1.1.1.1.202** *Likelihood ratio test of ρ2ρ 1= ρ3ρ1 = ρ3 ρ2 = 0*					
1.1.1.1.203	*1.1.1.1.204 χ2(3) = 72.11 Prob > χ2 = 0.0000****					**1.1.1.1.205**

Source: own survey results, 2022.

*Note: ***, ** and * indicated significance level at 1%, 5% and 10%, respectively. Y1, Y2 and Y3 are rural assemblers, direct to consumer and wholesaler/urban trader respectively.*

Sex of the household head had positively influenced the likelihood of choosing a wholesaler and negatively influenced the choice direct consumer at 1% and 5% levels of significance, respectively. Males have more time to sell and also hold large amount of haricot bean to sell, and consequently search for wholesalers even if the market place is far from their home. However, female households were more likely to opt for direct consumer. Similarly, Diro *et al.* (2017) demonstrated that male farmers have more resources available for transportation and time to sell their coffee product to far away markets.

The educational level of the household head was significantly and positively related to the choice of rural assemblers and wholesalers' market channels, and significantly and negatively related to the choice of direct consumer at 5%, 10% and 5% levels of significance, respectively. Moreover, education enhances the capability of farmers when making decisions with regard to the choice of market outlet based on the marketing margin and marketing cost. This finding is consistent with Medeksa (2014) who reported that educational level provides positive predictive power, whether or not the household chooses a coopharerative as the market outlet for their coffee. Education level of households has negative and significant effect at less than 5% probability level on choosing of direct to consumer. The more educated a farmer is the less likely to sell haricot bean through collector/rural assembler because more educated farmers are less time spend on doing marketing activities. The negative relationship between education level and selling to direct to consumers outlet can be explained by the fact that being educated enhances the capability of farmers in making informed decisions with regard to the choice of marketing outlets to sell their farm produce based on the marketing margin and marketing cost. A study by Nyaupane and Gillespie (2010) on factors influencing producers‟ marketing decisions in the Louisiana Crawfish Industry found that farmers with college degrees are more likely to sell their product via wholesalers and less likely to market via processors.

The likelihood of choosing wholesaler and direct to consumer outlet were positively and negatively affected by farming experience at 10% levels of significance for each market outlet. This result indicated that more experienced households in haricot bean production were more likely to deliver haricot bean to wholesaler outlet and less likely to sell to direct to consumers outlet. The many years engaged in haricot bean production and marketing gives the farmers desire to adjust their market links; trying alternative marketing outlets to increase sales volume or better prices all this to maximize profits. The relationship also implies that experienced farmers had better knowledge of cost and benefits associated with various haricot bean marketing outlets; consequently they are likely to increase the quantities supplied through the wholesalers to benefit from economies of scale. Riziki *et al*. (2015) found that households with more experience in agro-pastoralism are assumed to be more exposed and venture into commercial activities like African indigenous vegetables marketing because they aware marketing and differences in profitability in the different marketing outlets.

Household membership in cooperative could have better access to information that helps to production and marketing decisions. Membership in cooperative can also contribute towards reduced transaction costs and strengthen farmers bargaining power through networking and provision of up to dates information to members. Therefore, the result reveals being a member in cooperatives increases the likelihood of choosing urban trader outlet. This agreed with the findings of Berhanu K*, et al.,* (2013) and Siege G*., et al.,* (2014). Farmers who use credit may produce more output this might be due to use of credit provided for farm households a power to spend in input market that boost yield and thus leading to more marketable surplus. Likewise, use of credit eases liquidity constraints of households that contribute to market-oriented production. Therefore, this result reveals using credit reduces

the probability of choosing rural assemblers market outlet and increases the probability of choosing urban traders. This confirms the finding of Mmbando et al. (2014).

Distance to the nearest district market was an important variable that affect significantly the probability of haricot bean producer farmers decision to choose market outlets to sell their produce. The negative coefficient for urban trader outlet and positive sign for rural assembler outlet reveals farmers who are located farther away from market face higher transaction costs and so may opt for rural assemblers in their villages or in nearby villages rather than selling to urban traders in more distant market that increase transaction costs. This confirms the findings of Berhanu et al., (2013); Xaba and Masuku, (2013). Distance to all weather roads was found to have a significant and positive effect in the decision of choosing rural assembler outlet. The assumption here is that the closer a household farm or house to all weather road, the more will be the transportation facilities access. Proximity of farmers to all weather roads is essential for output disposal. This implies that farm households located far from all-weather road facing high transportation costs and thereby leading to decide to choose the nearby market outlet i.e. the rural assembler's market outlet. This result confirms the finding of Chirwa (2009) that distance to the tarmac road impedes the choice of private traders.

Price information was an important variable that affect significantly the probability of haricot bean producer farmer's decision to choose market outlets to sell their produce. The positive coefficient for urban trader outlet reveals having price information of different market outlets can create an opportunity to opt the best rewarding outlets. This agreed with the findings Siege et al., (2014) and Moti Jaleta, (2007) that price information can reduce transaction costs and improves the bargaining power of smallholder farmers. The marginal success probability for each equation or market outlet choice decision result reveals the likelihood of choosing rural assembler outlet was relatively low (51%) as compared to the probability of direct consumers outlet (57%) and urban traders (69%). This was due to the fact that rural assembler outlet offered lower price as compare to other outlets. Hence, haricot bean producer constraint to choose rural assembler outlet.

The finding reveals that, quantity of haricot bean supply to market was positively and negatively influenced the likelihood of choosing wholesaler and rural collector/assembler and direct to consumers market outlet at 1%, 1%, 1% significance level, respectively. This implies that the larger haricot bean quantity sold the more a farmer was likely to sell to wholesaler and less likely to sell to rural collector and direct to consumer outlet. The positive coefficient further implies that households tend to increase association with wholesaler when the amount they sold increase because wholesaler has capacity to purchase large volume of haricot bean. This may be because farmers producing small quantities have little opportunity to sell through wholesaler outlet and more likely to sell to rural collector and direct to consumer outlet. This is a line with Bezabih *et al*. (2015) reported that the likelihood of choosing collector and retailer only market outlet was negatively and significantly affected by potato quantity sold.

3.2.3 Haricot Bean Production, Market Supply and Marketing

Of their total land holdings, respondents in the study areas had been allocated 0.66 hectares of land for haricot bean production from total cultivated land of 2.286ha. According to the study result show that, mean yield of haricot bean production was 21.77 quintal per hectare in the study area which is greater than the national the average haricot bean productivity was about 15.89 quintal per hectare during 2022 according to the official statistics of the country, CSA. However, the experience from experimental plots indicates that 25-30 quintal per hectare can be obtained (EIAR, 2014). Haricot bean producer farmers were supply all of haricot bean to market in 2022 production season. The total average variable cost and revenue were 17,888.31and 34,232.82Birr/ha respectively. Shortage of quality seed, high cost of inputs, poor seed germination, limited knowledge on recommended agronomic practice, diseases and pest attacks, lack of storage and high perishability nature of product are the main production constraints of haricot bean whereas, suitable climatic conditions & fertile land and enabling policy environment & support from public organization & NGOs are the main opportunity for haricot bean production in the study area. The reason was due to the difference in haricot bean production between the districts. Price setting problem, product quality problem, broker interferences, low price for the products, limited function of cooperative and shortage of transportation are the main market problem of haricot bean product in the study area.

3.3 Haricot Bean Value Chain Actors and Their function in the Study Area

According to study result of this study show that, there are various actors involved in haricot bean input supply, production, trading/marketing and exporting, but the major ones are farmers/producers, input suppliers, traders/retailers, processors and exporters. In addition, there are enabling institutions, such as extension service providers and credit institutions and research and development centers, which play pivotal roles in the production, marketing and export system. These functions jointly improve the performance of the sector.

3.4 Haricot Bean Value Chain Map in the Study Area

As it is shown in Figure 1, the flow starts from the bottom stream to upper stream.

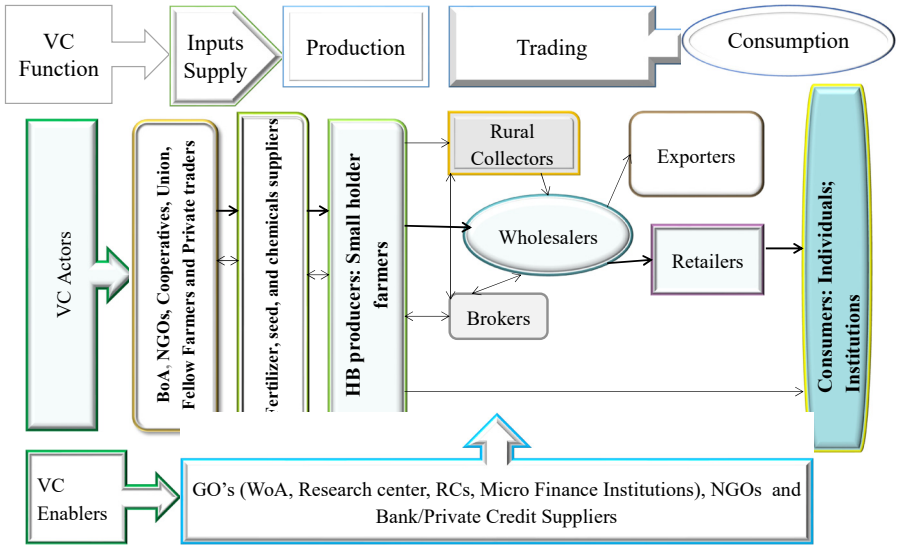

Figure 1. Haricot bean value chain map

3.5 Marketing Channels of Haricot Bean

According to the survey result, six main outlet channels were identified in terms of quantity of haricot bean flow in the study area. Haricot bean market performance was evaluated based on the level of marketing margins obtained and considering associated marketing costs for each key market channels. Accordingly, during the study time costs and purchase prices of the main chain actors', margins at farmers', collectors, wholesalers, urban retailers and consumers' level were analysed. Of total respondent farmers 77.5% sold haricot bean to local collector/assembler, 15% to wholesalers and 7.5% to consumer. The market channels identified during the survey were:

Channel I: Producer--->Consumer

Channel II: Producer--->Rural collector--->Wholesaler--->retailer--->Consumer

Channel III: Producer--->Wholesaler--->Consumer

Channel IV: Producer --->Retailers --->Consumers

Channel V: Producer --->Rural Collectors---> Consumers

Channel VI: Producer--->Wholesaler--->retailer--->Consumer

4. Conclusion and Recommendations

Haricot bean is one of the potential food and cash crops which have a significant contribution to the livelihood of farmers in the study area. Result of the study analysis indicates that the average yield of haricot bean was 21.72qt/ha. In the value chain of Haricot bean input

suppliers, farmers, collectors, traders, transporters and consumers are the major value chain actors who perform various value chain activities. Six marketing channels of haricot bean are exhibited in the study areas.

Estimates of the multiple linear regression models indicate that the level of haricot bean supply to the market is determined by educational level of HH, Haricot bean farming experience, land allocated for haricot bean, market price of haricot bean, TLU, access to credit, and access to market information positively whereas its negatively influenced by Distance to the nearest market centre and HH participation in off/non-farm activity. To increase volume haricot bean supplied to the market policy makers should focus more on; upgrading the knowledge of the households through education, experience sharing and trainings (market related), Interventions in the form of establishing new farmers cooperatives/groups and improves the existing farmers cooperatives/groups to collect haricot bean products and link farmers cooperatives/groups with output markets are required to reduce broker interferences and transportation costs and also sustain farmers benefits from their products, Delivering proper and adequate market information through strengthening market information delivery network and also link farmers' cooperatives/groups with proper sources of market information to enhance haricot bean producers' farmer regular access to information on market dynamics, Improving market access could be a pathway for increasing haricot bean market participation (as sellers) of farmers. Therefore, improving road access to rural kebeles will encourage farmers to supply haricot bean to the market where they need to sale because it makes easy for transportation availability.

The findings point to the need for increasing the quantity of haricot bean sold for choice of appropriate market outlets by improving productivity of haricot bean. Policy makers should focus more on enhancing producers marketed surplus of haricot bean which could be attained through providing the marketing infrastructure, technical and organizational assistance, and access to markets and support to improve the farmers bargaining power by establishment of farmers' organizations. Moreover, the concerned authority should be able to increase the awareness of households about the importance of formal education to choices appropriate market outlets. Distance from the farm to the nearest market significantly affect market outlets choice decision, government should ensure developing markets for haricot bean within reach this will motivate a lot of farmers to participate in haricot bean supply to increase their income and choice of appropriate outlets. Firstly, collector outlet choice is negatively and significantly affected by Education, quantity produced and distances from the nearest market centre. Therefore, these factors must be promoted by upgrading the knowledge of the households through education and trainings, increase quantity of haricot bean produced and developing road infrastructures. Secondly, farm experience and quantity of haricot bean produced significantly and positively affected wholesaler outlet choice. Therefore, improving farmers' farm experience through arranging experience sharing from older farmers is essential to make haricot bean market efficient in addition to increasing quantity of haricot bean produced. Therefore, these factors must be considered in future intervention.

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