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Vegetable Market Chain Analysis in Mecha District, West Gojjam Zone, Amhara National Regional State

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

The study attempts to investigate the marketing channels of vegetables, to identify the actor who gets the major share of the marketing margins in vegetable marketing channels at the study area and to discover the major factors of market supply of vegetable in Mecha District.

Descriptive and causal explanatory research design was employed with an aim of describing the market chain map of vegetables and stating the determinants of market supply of vegetables in Mecha District.

The study was done at Department of Marketing Management, Aksum University between February 2018 and May 2018.

The study included 120 farmers and 20 traders that involve in vegetable production and marketing activities.

Producers, brokers, cooperatives, local collectors, wholesalers, retailers and consumers were found the main actors of the marketing channel in the study area. Six major channels for onion and five major channels for tomato were identified based on volume of the commodities transacted in the channels. Retailers were identified as the parties who take the largest Net Marketing Margin both in onion and tomato market channels. Retailers take 30.3 percent of the final consumer price in the onion market as Net Marketing Margin and they take 54.16 percent of the final consumer price in tomato market. The factors which determine market supply of onion were identified as education level of the household head, access to market, access to market information and price.

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For tomato, the factors which determine its market supply were identified as education level of the household, experience and price.
The study mainly concludes that producers were not getting their deserving marketing margins while the intermediaries' are taking advantage from them. Therefore the producers are in need of marketing support that may decrease the number of intermediaries and ensure them a larger marketing margin out of their produces.

Keywords: Market chain; Vegetable market; Mecha district; Agricultural marketing.

1. INTRODUCTION

According to National Bank of Ethiopia [1], Ethiopia earned USD 47.6 million from export of fruits and vegetables, 3.6 percent higher than the previous year, 2014. The rise in the value of export was due to a 3.2 percent increase in volume and 0.3 percent increase in international price. Their share in total exports was merely 1.6 percent.

Households living near to urban centres largely practice vegetable farming. Most vegetables are not commonly practiced by the rural private peasant holders, hence the small volume of production recorded as well evidenced by the survey results. Vegetables took up about 1.69 percent of the area under all crops at national level and the production of vegetables contributes 2.17 percent of the total crops production [2].

The expansion of irrigation agriculture in different parts of the country has enabled smallholders to produce vegetable even in dry season. Through irrigation, farmer's per capita production as well as area under vegetable coverage has been increasing [3]. These conditions enable small holders to have better surplus for market. Like most of agricultural products, vegetable production exhibits seasonality in supply. This creates excess supply of vegetable to markets within limited time frames which leads to decline of prices. Furthermore, due to absence of sufficient local markets and efficient marketing system, farmers are obliged to sell their outputs at lower prices [4].

In Mecha District, in the past production year 2016/2017, onion covered 931 hectare of land and 107,191 quintal was produced of which 80,393 quintal was supplied to market while 132 hectare of land was covered by tomato and 25,840 quintal was produced by which 16,796 quintal of it was supplied to the market [5].

Even though the region is endowed with diverse agro-ecologies, fertile soil and plenty of water potential, problems in the vegetables market chain hinder the potential gains that could have been attained from the existing opportunities. In this regard, vegetable market chain analysis is an interesting process that has not been investigated much in the study area.

The vegetable market chain analysis research conducted in case of Fogera District in the region by Abay [6] and other market chain analysis studies conducted in the region by Getachew [7]; and Bossena [8] do not consider studying the party who gets the major share of the marketing margins in vegetable, Honey, Sesame and Cotton marketing channels respectively.

Therefore, this study was initiated with aim of investigating the party who gets the major share of the marketing margins in vegetable marketing channels at the study area in particular in order to partially fill the gap for the region and to serve as a basis for other researchers as a whole. The study is limited to the crops onion and tomato because of their largest coverage and the marketing problem they usually face.

1.1 Objectives

- ✓ To identify the functions performed by actors in the marketing channels of vegetables in the study district.
- ✓ To identify the actor who gets the major share of the marketing margins in vegetable marketing channels at the study area.
- ✓ To discover the major determinant factors of market supply of vegetable in Mecha district,

1.2 Vegetable Production and Marketing in Ethiopia

Ethiopia has a variety of vegetable crops grown in different agro ecological zones by small farmers, mainly as a source of income as well as food. The production of vegetables varies from cultivating a few plants in the backyards, for

home consumption, to large-scale production for the domestic and home markets. In the year 2016, a total of 2,789,202 hectares of land were covered by vegetables, root crops and permanent crops by both smallholder and commercial farms. The total crop output for these crops was found 266,333,191 quintals. From these a total area of 13,361.58 ha of land was covered by vegetables and 127,431.73 quintal was produced, CSA [9]. It is estimated that an average Ethiopian consumes less than a 100 g of vegetables and fruits (combined) a day. This is not enough to maintain a healthy lifestyle and much below the levels of per capita daily consumption of vegetables/fruits suggested by the WHO. Such low levels of vegetables production and consumption result in a society being significantly vitamins-deprived, SNV [10].

2. MATERIALS AND METHODS

2.1 Description of the Study Area

The study area is Mecha District, which is located, between 11°10' and 11°25' North latitude and 37°2' and 37°17' East longitude in Blue Nile basin, within the Highland of Ethiopia, and administratively the district is found in West Gojjam Zone of the Amhara National Regional state. The District is bordered on the south by Sekela, on the southwest by the Agew Awi Zone, on the west by the Gilgel Abay River (Lesser Abay River) which separates it from South Achefer and North Achefer, on the northeast by Bahir Dar Zuria, and on the east by Yilmana Densa District. The mean annual rainfall recorded in the area is 1480 mm with mean monthly temperature of 25.8°C. The elevation ranges between 1885-3131 meters above sea level, and the slope ranges from nearly flat to very steep. It is one of the food secure areas with no history of relief assistance. Surplus vegetable and crop production ensures food self sufficiency and generates relatively higher cash income specifically for the better-off and middle households. Crop, livestock, and mixed farming are the dominant production system in the District.

Based on the 2007 national census conducted by the Central Statistical Agency of Ethiopia (CSA), this District has a total population of 292,080, an increase of 36.55 percent over the 1994 census, of whom 147,611 are men and 144,469 women; the majority of the population, which is 269,403 or 92.24 percent are rural inhabitants. With an area of 1,481.64 square kilometers, Mecha has a population density of 197.13, which is greater than the Zone average of 158.25 persons per square kilometer. A total of 66,107 households were counted in this District, resulting in an average of 4.42 persons to a household, and 64,206 housing units. The majority (98.91 percent) of the inhabitants practiced Ethiopian Orthodox Christianity as their religion. The largest ethnic group reported in Mecha was the Amhara (99.91 percent). Amharic was spoken as a first language by 99.96 percent.

2.2 Method of Data Collection

In this study primary data were collected focusing on market chain actors and their linkages, prices, volume and direction of trade, role of marketing agents, nature of the market, marketing functions, marketing costs, and other variables who were expected to affect market supply of onion and tomato producers.

Secondary data was collected from Regional Bureaus of agriculture and rural development, *District* office of small scale trade and industry, Central statistics agency and their different publications, and Ministry of agriculture. Regarding data collection of the producers, semi-structured questionnaires were prepared regarding the onion and tomato market chain.

Regarding trader respondents, independent interview schedule questionnaire was designed to collect data.

Key Informant Interviews were also employed and purposive sampling was employed to collect data from knowledgeable people such as experienced farmers, Extension workers, horticultural experts and traders, a total of 16 key informants were interviewed from the above listed different stakeholders including institutions.

2.2.1 Producers survey

Multi– stage sampling techniques were used to select sample vegetable producer farmers. In the first stage, 3 kebeles from the District (Enamirt, Amarit and Ambo Mesk) were selected from the available 43 kebeles purposively based on their potential of vegetable production and marketing. The basic assumption behind purposive sampling is that ‘'with sound judgment about the purpose of an inquiry, researchers can strategically select adequate cases for a study and organize the information effectively" Deribsa [11]. In the second stage, to take a specific

number of producers the researcher referred different documents. A Kebele administration in Ethiopia has an average of 500 households, Lanham [12]. The District office of agriculture gave a conservative estimate that 40 percent of the population in each kebele was vegetable producer. This makes the number of vegetable producers of the three Kebeles a total of 600. These 600 vegetable producers were clustered into two groups. Deribsa [11] stated that cluster sampling is a situation in which groups (clusters) than individual subjects are focused initially in the selection procedures. The first group includes those who produce both commodities onion and tomato whereas the second group included producers who grow other vegetable varieties. The cluster was based on the data from the District office of agriculture which show that there were a total of 127 farmers who produced both commodities (onion and tomato) in the 2016/2017 cropping season from the three Kebeles. The researcher then took all of the 127 producers from the three kebeles using census sampling technique. The researcher in this study took a total sample of 127 onion and tomato producers which is about 20 percent of the total vegetable producers in the three Kebeles.

2.2.2 Market/ traders' survey

The sites for the trader surveys were market towns in which a good sample of vegetable traders were existed. Based on the flow of vegetable, three markets (Meshenti, Bahir Dar and Merawi) were selected purposely, which are the main vegetable marketing sites in the study area. Systematic random sampling was employed to select traders. By considering limit of time and other resources, the researcher used sample size of 20 traders using purposive sampling. A semi-structured questionnaire was utilized to collect the data from the traders.

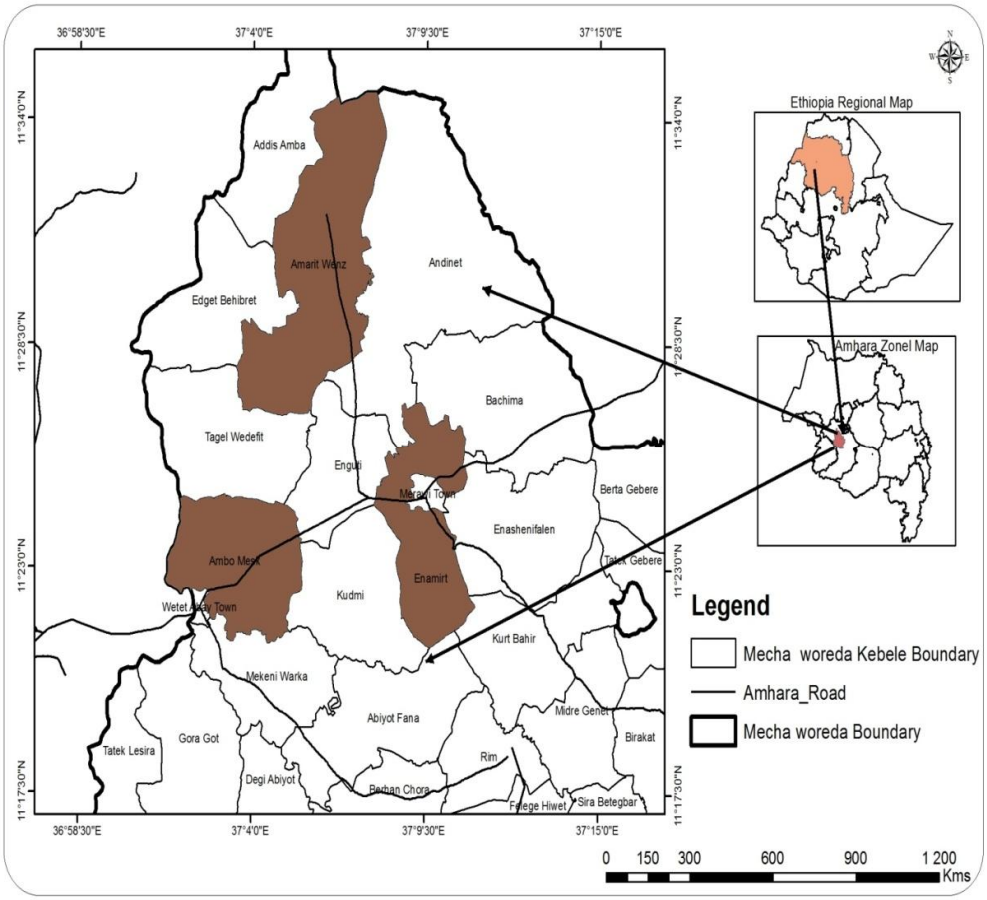

Fig. 2.1. Map of Ethiopia, Amhara region and the study area

Table 2.1. Traders sampled in the study area

Traders	Bahir Dar	Merawi	Meshenti	Amarit	Enamirt	ambo mesk
Village level collectors	-	-	-	2	2	2
Cooperatives	-		-	1	1	1
Brokers	-	-	-	1	1	1
Wholesalers	-	4	-	-	-	-
Retailers	1	1	2	-	-	-
Total	1	5	2	4	4	4

Source; Survey result, 2018

2.3 Method of Measurement for Analysis

2.3.1 Marketing margin

Computing the total gross marketing margin (TGMM) is always related to the final price or the price paid by the end consumer and expressed as a percentage.

$$\text{TGMM} = \frac{\text{Consumer price} - \text{Farmer's price}}{\text{Consumer price}} \text{X100}$$

$$\text{GMMP} = \frac{\text{Price paid by consumer} - \text{Marketing gross margin}}{\text{Price paid by the consumer}} \text{X100}$$

$$\text{NMM} = \frac{\text{Gross Margin} - \text{Marketing Costs}}{\text{Price paid by consumers}} \text{X100}$$

Where: TGMM = Total Gross Marketing Margin
GMMp = Gross Marketing Margin of Producers
NMM = Net Marketing Margin

2.3.2 Concentration ratio (CR)

The concentration ratio is a way of measuring the concentration of market share held by particular suppliers in a market. It is the percentage of total market sales accounted for by a given number of leading firms.

$$C = \sum_{i=1}^{m} S_i \qquad \text{i =1,2,.....,m}$$

Where s_i represents market share of i^{th} firm and m is number of largest firms for which the ratio is going to be calculated.

2.3.3 Market efficiency

To measure the marketing efficiency, there are three popular methods namely, conventional, Shepherd's and Acharya's methods. The three market efficiency measurement methods are presented as follows:

1) Conventional method:

$$\text{ME} = \frac{\text{MC+NMM}}{\text{MC}} = \frac{\text{GMM}}{\text{MC}}$$

Where:

ME : marketing efficiency
NMM : net marketing margin
MC : Marketing cost
GMM : Gross marketing margin

2) Shepherd's method:

$$\text{ME} = \frac{\text{RP}}{\text{MC+NMM}} = \frac{\text{RP}}{\text{GMM}}$$

Where: RP- Retailer's price or Price paid by the consumer

3) Acharya's method:

$$\text{MME} = \frac{\frac{\text{FP}}{\text{MC+NMM}}}{\frac{\text{RP}}{\text{MC+NMM}} - 1}$$ As,[RP = FP+MC+NMM]

Where: FP-Net price received by the producer
MME- Modified measure of marketing efficiency

Therefore, based on the result of the calculation:

If: ME =1, Marketing system is efficient
ME >1, Marketing system is highly efficient
ME <1, Marketing system is not efficient

For the case of simplicity, the conventional method was employed for this study.

2.4 Model Specification

The multiple linear regression model is specified as Y=f(sex, age, education, experience, price, access to market information, post harvest handling practice, access to extension services, access to credit, access to market...etc).The

model specification of supply function in matrix notation is estimated by:

$$Y = \beta X + U$$

Where, Yi = Vegetable supplied to the market

B = a vector of estimated coefficient of the explanatory variables
X = a vector of explanatory variables
Ui = disturbance term
Y = Quantity of vegetable supplied to the market
X_1 = post harvest value addition
X_2 = Age of the household head
X_3 = Education level of the household head
X_4 = Experience on production
X_5 = Access to market
X_6 = Access to market information
X_7 = Price
X_8 = Access to extension service
X_9 = Access to credit
X_{10}= Sex of household head

3. RESULTS AND DISCUSSION

3.1 Marketing Participants, their Roles and Linkages

Market participants in the study areas include: producer, cooperatives, local collectors, brokers, wholesalers, retailers, and final consumers of the product. Even though, each participant was involved in different activities (wholesale, retail, aggregating etc), based on major activity is undertaken, the sampled market participants were categorized into different categories.

About 30 percent of onion traders reported that village level aggregators are the major functional parties in the chain followed by wholesalers (25 percent). On the other hand, in the tomato market chain wholesalers are the principal parties dominating the chain followed by brokers holding 35 and 30 percent of the volume under the transaction respectively.

3.2 Marketing Channels

3.2.1 Onion market channel

Six marketing channel were identified for onion of which one has gone out of the region.

The channel comparison was made based on volume that passed through each channel.

Accordingly, the producer--local collector--wholesaler-retailer- consumer market channel carried the largest volume i.e. 2606 qt of onion which is 34 percent of the total volume followed by Producer → wholesaler → Retailer √consumer market channel which carried a total volume of 1916 Qt of onion and was about 25 percent of the total volume marketed by the sampled respondents.

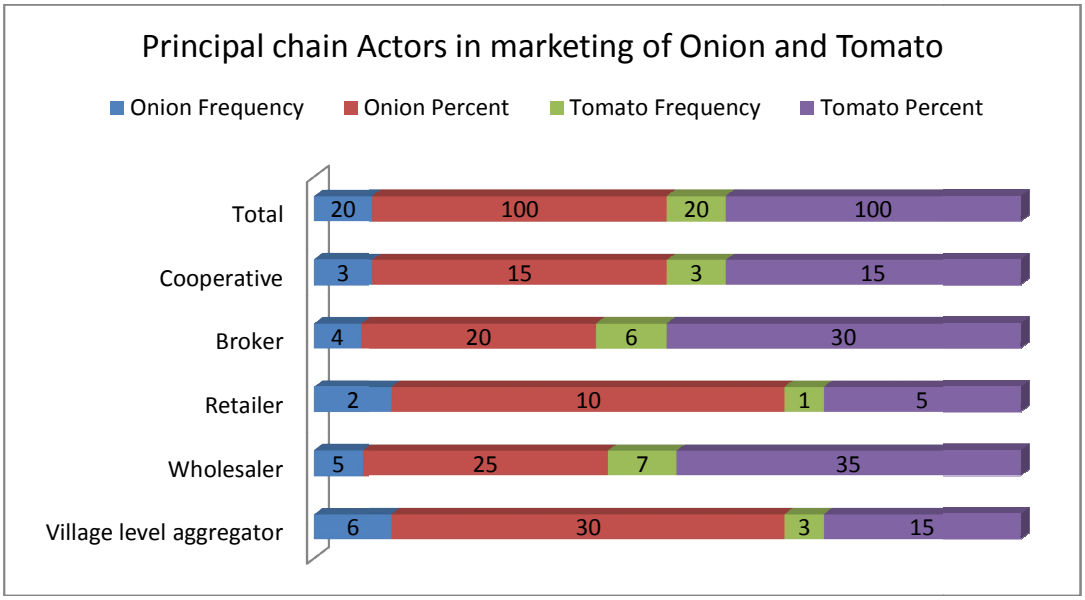

Fig. 3.1. Principal Chain actors in marketing of onion and tomato

Channel I; Producer → Cooperatives → Wholesaler → Retailer →Consumer; this channel represented 8 percent of total onion (613 qt) marketed by the sampled producers during the survey period. The channel was found to be the fifth important marketing channel in terms of volume.

Channel II; Producer → Cooperatives → Retailer → Consumer; this channel accounted for 7 percent of total onion (537 qt) marketed in the study area during the survey period. The channel was found to be the least important channel in terms of volume.

Channel III; Producer → Brokers → Wholesaler → Retailer → Consumers; it accounted for 10 percent of total onion (766 qt) marketed during the survey period. The channel was found to be the fourth important in terms of volume.

Channel IV; Producer → Local Collector →Wholesaler → Retailer → Consumer; the channel **r**epresented 34 percent of the total onion (2606 qt) marketed during the survey period. It was founded the first most important channel in the study area in terms of volume.

Channel V; Producer → Wholesaler → Retailer → Consumer; accounted for 25 percent of total onion (1916 qt) marketed in the study area during the survey period. The channel was found to be the second most important channel in terms of volume.

Channel VI; Producer → Broker → Out of region; it accounted for 16 percent of total onion (1226 qt) marketed during the survey period. The channel was found to be the third in terms of volume and the shortest in terms of intermediaries in onion marketing channel in the study area. This was the channel which mostly directed to Addis Ababa market.

3.2.2 Tomato market chain

Five main market channels were identified for tomato marketing by which all channels remained in the region. Based on the data, Producer →Retailer →consumer channel was found channel for the largest volume of tomato (43 percent) followed by Producer-Wholesaler-Retailer-Consumer channel which accounted for 19 percent of the total tomato marketed from the market.

Channel I; Producer → Retailer → Consumer; this was the shortest and the most important channel in terms of volume holding 43 percent of the total tomato supplied (1406 qt) by the sampled producers.

Channel II; Producer → Wholesaler → Retailer → Consumer; It accounted for 19 percent of total tomato marketed (621 qt) during the survey period. The channel was found to be the second most important in terms of volume.

Channel III; Producer → Cooperatives → Retailer → Consumer; It represented 15 percent of total tomato marketed (491 qt) during the survey period. The channel was found to be the third most important marketing channel in terms of volume.

Channel IV; Producer → Local Collector → Retailer → Consumer; It accounted for 11 percent of total tomato marketed (360 qt) during the survey period. The channel was found to be the least important in terms of volume.

Channel V; Producer → Brokers → Wholesalers → Retailers → Consumer; Represented 12 percent of the total tomato marketed which amounted about 392 qt of tomato during the survey period. The channel was the fourth important and the longest tomato marketing channel in the study area in terms of volume.

Table 3.2. Destination of the out of region sales

Commodity	Destination (Percent)				
	Domestic	Out of region			
		Welega	Addis ababa	Tigray	Total
Onion	60	20	16	4	100
Tomato	80	10	8	2	100

Source: Own computation from survey result, 2018

3.3 Marketing Margin

A) Onion

For the actors and channel members trading onion, the computed marketing margin indicated, the total gross marketing margin (TGMM) is highest in Channel IV which accounted for 67.33 percent; followed by channel V which accounted for 63.23 of the consumer price. The minimum TGMM is in channel II which accounted 52.05 percent of the consumers' price. From all of the onion traders, wholesalers get the highest TGMM which accounted for 41.81 percent of consumers' price and next 35.38 percent by retailers. Onion producer's average share is 41.68 percent of consumer price and the highest farmers share on the consumers' price accounted for 47.94 percent in channel II.

Finally, among onion market actors, retailers in channel II had relatively the highest net marketing margin 30.3 percent followed by wholesalers in channel V which accounted 23.28 percent. Here the higher the NMM of the marketing intermediaries reflects unfair income distribution between onion producing farmers and the market chain actors.

B) Tomato

The computed marketing margin among different actors and channels of tomato trade indicated, the total gross marketing margin (TGMM) is highest in Channel III and IV which accounted for 92.85 percent; followed by channel II which accounted for 88.57 percent of the consumer price. The minimum TGMM is in channel I which accounted 66.67 percent of the consumers' price. From all of tomato traders, retailers get the highest TGMM which accounted for 66.67 percent of consumers' price and next 60 percent by wholesalers. The highest farmers share on the consumers' price accounted for 35.71 percent at channel V.

Finally, among tomato market actors, retailers in the channel I had the highest net marketing margin 54.16 percent followed by local collectors in channel IV which accounted 50 percent. Here in the tomato marketing channel, the extremely higher NMM of the marketing intermediaries reflects unfair income distribution between tomato producing farmers and the market chain actors by which the producers are exploited.

The problem of unfair margin share is recognized by the Amhara region horticulture development project and considering the unfair margin of the onion and tomato producers the Amhara region horticulture development strategic plan (2015-2019) aimed that after the plan smallholder farmers will derive maximum gross margin from fruit and vegetable sub-sector, at least twice the current level by the 2019.

3.4 The Degree of Market Concentration

Kohls and Uhl [13] suggested that as a rule of thumb, four largest enterprises concentration ratio of 50 percent or more is an indication of a strongly oligopolistic industry, 33 to 50 percent a weak oligopoly, and less than that, uncon-centrated industry.

Concentration ratio is used as an indicator of the relative size of the firm in relation to the whole. Concentrations have been computed for wholesalers found in the study area (Tables 3.5 and 3.6) due that they have a direct impact on vegetables (onion and tomato) trade.

Table 3.3. Marketing margins of traders in different onion marketing channels

Marketing margin	Onion marketing channels				
	Channel I	Channel II	Channel III	Channel IV	Channel V
TGMM	55.34	52.05	53.59	67.33	63.23
TGMM-co	12.5	16.67	-	-	-
TGMM-w	25.92	-	27.88	27.58	41.81
TGMM-r	16.92	35.38	25.71	17.14	21.42
TGMM-Lc	-	-	-	22.61	-
TGMM-f	44.66	47.94	46.4	32.66	36.77
NMM-co	3.76	6.84	-	-	-
NMM-w	11.23	-	11.14	13.28	23.28
NMM-r	11.84	30.3	21	12.42	16.71
NMM-Lc	-	-	-	6.57	-

Source: Own computation from survey result, 2018

Table 3.4. Marketing margins of traders in different tomato marketing channels

Marketing margin	Tomato marketing channels				
	Channel I	Channel II	Channel III	Channel IV	Channel V
TGMM	66.67	88.57	92.85	92.85	64.28
TGMM-co	-	-	50	-	-
TGMM-w	-	60	-	-	50
TGMM-r	66.67	28.57	42.85	42.85	14.28
TGMM-Lc	-	-	-	-	-
TGMM-f	33.3	11.43	7.15	7.15	35.71
NMM-co	-	-	21	-	-
NMM-w	-	25	-	-	25
NMM-r	54.16	17.85	32.14	-	3.57
NMM-Lc	-	-	-	50	-

Source: Own computation from survey result, 2018

Table 3.5. Concentration ratio for onion wholesalers

R/n	Wholesalers	Yearly quintals supplied (Sept 2015 - Aug 2016)	Percent
1	Wholesaler 1	1916	25
2	Wholesaler 2	766	10
3	Wholesaler 3	628	8.19
4	Wholesaler 4	613	7.99
5	Total supply of Top 4 Wholesalers	3923	51.18
6	Total onion supplied in 2009 E.C	7664	100

Source: Own computation from survey result, 2018

Table 3.6. Concentration ratio for tomato traders

R/n	Wholesalers	Yearly quintals supplied (Sept 2015 - Aug 2016)	Percent
1	Wholesaler 1	338	10.33
2	Wholesaler 2	283	8.65
3	Wholesaler 3	250	7.64
4	Wholesaler 4	142	4.34
5	Total supply of Top 4 Wholesalers	1013	30.96
6	Total tomato supplied in 2009 E.C	3270	100

Source: Own computation from survey result, 2018

As shown in Table 3.5, applying the market structure criteria, concentration ratio was measured by the percentage share of volume of onion and tomato handled by the largest four traders in the market. Thus, the onion market shows oligopoly market. This suggests that there was market concentration by few firms. But the tomato market shows unconcentrated market by which it is called loose oligopoly. It is known that in such type of market, price is determined by both demand and supply which gives a bargaining power to customers. Therefore, it is witnessed by the survey that tomato price was very lower in the market which is up to ETB 1 per Kg and that is an indicator of the absence of oligopoly in that specific product market.

3.5 Efficiency of the Vegetable Marketing System in the Study Area

The conventional method, Shepherd's Method and Acharya's modified marketing efficiency methods are used to estimating marketing efficiency of marketing channels or intermediaries. The result of the efficiency of marketing in all channels through the three methods is the same. The difference is only in the magnitude of the ME. Hence, for the sake of simplicity of manipulation the conventional method of calculation was used in this research.

The estimated marketing efficiency of onion were 4.3, 7.18, 5.2, 3.89 and 5.5 for channels I, II, III, IV and V respectively. Hence marketing channel

IV of onion was less efficient with value of 3.89. The highest marketing efficiency is achieved if onion supplied through channel II which is 7.18.

For the channels of tomato, the estimated marketing efficiency were 8, 2.5, 3.125, 2.34, and 3 for channels I, II, III, IV and V respectively. Hence marketing channel IV of tomato was less efficient with a value of 2.34. The highest marketing efficiency was achieved if tomato supplied through channel I which was 8 and channel I was the channel where the major volume of tomato passed through.

3.6 Determinants of Vegetables Market Supply

As can be observed from the econometric result in Table 3.9, out of 10 hypothesized explanatory variables for onion, four variables were found to determine the marketable supply of onion at the farm level. These are education level of the household head, access to market, access to market information, and price of onion in the past production year 2015/2016.

Therefore, the regression equation can be stated as $Y = \beta X + U$, which is Quantity of Onion supplied to market = 4.040 + 0.218(Education Level) + 0.154(Access to Market Information) + 0.265(Price of onion) – 0.297(Access to Market) + disturbance term.

From the significant variables, Access to market shows an inverse relationship with market supply of onion and the variable is the most affecting variable by 29.7 percent negatively. Price, education level and access to market information show a positive effect and are the most affecting variables in their order by 26.5 percent, 21.8 percent and 15.4 percent, respectively.

Table 3.7. Efficiency of the onion marketing system in the study area

	Channels				
	I	**II**	**III**	**IV**	**V**
Total value added	540	420	520	580	550
Total cost	125.5	58.5	100	149	100
Market Efficiency	4.3	**7.18**	5.2	3.89	5.5

Source: Own computation from survey result, 2018

Table 3.8. Efficiency of the tomato marketing system in the study area

	Channels				
	I	**II**	**III**	**IV**	**V**
Total value added	300	250	200	200	300
Total cost	37.5	100	64	85.5	100
Market Efficiency	**8**	2.5	3.125	2.34	3

Source: Own computation from survey result, 2018

Table 3.9. Determinants of onion supplied to the market

Model	**Unstandardized coefficients**		**Standardized coefficients**	**T**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	4.040	3.645		1.108	.272
Post Harvest value addition	.126	.604	.008	.209	.835
Age of the Household Head	.014	.023	.025	.614	.542
Educational level of the Household Head	1.668	.578	.218	2.886	.006
Years of Experience in onion production	.261	.217	.114	1.205	.233
Access to Market for onion	-.576	.209	-.297	-2.755	.008
Access to market information	2.302	.958	.154	2.402	.020
price of onion per quintals in 2015/2016	.002	.001	.265	3.207	.002
Access to Extension service	.454	.877	.029	.517	.607
Access to credit	1.844	1.084	.070	1.701	.094
Sex of Household Head	1.220	.668	.073	1.826	.073

a. Dependent Variable: Total amount of onion supplied to market in 2009 E.C

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.961[a]	.923	.909	2.25106

Source; SPSS output, 2018

Table 3.10. Determinants of tomato supplied to the market

Coefficients[a]					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	-1.847	3.495		-.528	.599
Post Harvest value addition	.469	1.080	.026	.434	.666
Age of the Household Head	-.007	.039	-.010	-.168	.867
Educational level of the Household Head	1.433	.694	.156	2.065	.043
Years of Experience in tomato production	1.692	.210	.642	8.071	.000
Access to Market for tomato	.055	.149	.023	.369	.713
Access to market information	-1.235	1.665	-.069	-.741	.462
price of tomato per quintals in 2015/2016	.003	.001	.298	3.814	.000
Access to Extension service	.085	1.364	.004	.063	.950
Access to credit	.470	1.870	.015	.252	.802
Sex of Household Head	.124	1.205	.006	.103	.918

a. Dependent Variable: Total amount of tomato supplied to market in 2009 E.C

Model Summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.917[a]	.840	.812	3.88057

Source; SPSS output, 2018

From the 10 hypothesized variables which were expected to have an effect on the quantity of tomato supplied to the market, only three variables were found significant that are education level of the household head, experience and price.

The regression equation for tomato can be stated as $Y = \beta X + U$, which is Quantity of Tomato supplied to market = -1.847 + 0.156(Education Level) + 0.642(Experience) + 0.298 (Price of Tomato in 2015/2016) + disturbance term

4. CONCLUSION AND RECOMMENDATION

The most functional actors were identified in the marketing of onion and tomato. Village level aggregators, wholesalers, retailers, brokers, and cooperatives were identified as the major parties operating in the onion and tomato market channel. The study identified that retailers got the highest net marketing margin than all actors in the market for both commodities. Especially in the tomato channels, they take more than half of the consumer price as their Net marketing Margin. The result of multiple linear regression model show that education level of the household, access to market, access to market information and price of onion in 2015/2016 determine quantity of onion supplied to market. For tomato, only three variables were found which determine quantity supply i.e. education level of the household head, experience on tomato production and price of tomato in 2015/2016. Regarding the market channels, most of the tomato produced passes through the shortest channel but large amount of onion passes through one of the longest channels. The onion market channel shows oligopolistic market nature by which it is controlled by few large wholesalers while the tomato market operates in unconcentrated market/ loose oligopoly.

It is recommended that regional government should intervene in controlling the illegal traders and legalize them and, impose them a tax to make the market fair and also providing the farmers with post harvest handling technology and subsidies for ease to transport their produce that will in return increase the quality and amount of supply. In addition, in order to improve bargaining power of producers and to help them getting the fair margin, the District office of agriculture should prepare and apply periodical and rotating crop calendar for different Kebeles

in the study area. The regional government should consider the production capacity of the district and act to solve the marketing problem they face. Therefore, it should initiate the federal government to establish agro processing plant around the area which will have a major role in efficiently using the capacity and to make the farmers get fair margin and increase their financial capacity. The agricultural and multi-purpose cooperatives which are functioning in the area should also play their key role in facilitating the vegetables marketing activity by shortening the market channels through creating awareness for the farmers regarding the current market price and other necessary market information.

5. LIMITATIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Due to the challenges of Lack of adequate time and budget the researcher has faced, the geographical scope of the study was limited to only Mecha District and the three Kebeles. The commodities are also limited to only onion and tomato. Therefore researchers who want to conduct research in this stream would be better if they include more kebeles and commodities.

COMPETING INTERESTS

The author has declared that no competing interests exist.

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