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MARKET ORIENTATION AND PERFORMANCE OF SMALLHOLDER TOMATO PRODUCERS

Purpose. *The aim of this study is to identify the determinants of market orientation of smallholder tomato producers and to determine the status of market performance along the market chain using the example of Zewaydugda district of Ethiopia.*

Methodology / approach. *This research was conducted at Zewaydugda district in Oromia regional state of Ethiopia. For conducting this study, we selected five kebeles which are the smallest administrative units in the country, and a total of 191 smallholder tomato producers randomly. We used descriptive analysis, marketing performance analysis and econometrics models to analyse the data. We used a kobo toolbox to collect the data from the respondents. We collected the data from respondents using a face-to-face interview in 2022.*

Results. *The crop marketability index (CMI) showed that 82.96 % of the produced tomatoes were sold to the market with an average selling price of 1143.2 Birr per quintal and the average market orientation index (MOI) of producers was 30.54 % and it means that farmers are moderately market oriented in tomato production in the study area. The econometrics result of Ordinary Least Squares (OLS) estimation showed that, family size, access to credit, access to improved seed, and amount of land allocated for tomato production significantly affects the farmer's market orientation. In addition, the result of market performance analysis showed that 61.64 % of the total gross marketing margin accounted for by traders while 38.36 % – by producers. Furthermore, the study identified that: lack of fair sales price, lack of market information, poor linkage with other value chain actors, and perishability were the dominant marketing problems faced by tomato producers.*

Originality / scientific novelty. *Our research stands out in the field of market orientation and the performance of smallholder tomato producers due to its innovative approach and unique contributions to existing knowledge. While previous studies have explored the relationship between market orientation and performance in agricultural contexts, particularly focusing on large-scale operations, our study specifically targets smallholder tomato producers, a demographic often overlooked in research. Thanks to our thorough empirical investigation and theoretical framework, we not only advance the understanding of market orientation in the agricultural sector but also provide actionable recommendations to enhance the performance and sustainability of smallholder tomato producers in diverse market environments.*

Practical value / implications. *The findings of this research can be used for policy makers. Thus, policies focusing on reducing illegal brokers, increasing farmers' awareness to allocate more cultivable land, reducing the price difference among producers and traders, enhancing farmers to get access to credit and access to improved seed, strengthening market linkages among the value chain actors needs better attention to improve tomato producers' market orientation and marketing performance of the study area.*

Key words: *market orientation, market performance, tomato, OLS estimation, Ethiopia.*

1. INTRODUCTION

Tomato (Lycopersicon esculentum Mill.) is one of the most widely grown vegetable crops in the world. It is the 3-rd largest vegetable crop after potato and sweet potato and as a processing crop it ranks first among all vegetables (Gemechu & Beyene, 2019). However, many smallholders are trapped in semi-subsistence agriculture, disconnected from markets (Snoxell & Lyne, 2019).

The development of vegetable farming in general and vegetable marketing in Ethiopia in particular is constrained by a number of factors including Policy implementation gap, inadequate vegetable seed regulatory frameworks, inadequate quality control and certification mechanisms, limited capacity and capability supporting efficient and regular vegetable seed supply, inefficient seed importation and distribution system, high post-harvest losses, high incidence of diseases and insect pests, poor vegetable marketing and value chain development and weak linkage and integration among stakeholders (Emana et al., 2014).

According to Wondim (2021), vegetable production including tomato is becoming an increasingly important activity in the agricultural sector of Ethiopia following the development of irrigation and increased emphases given by the government to small scale commercial farmers. According to Kassaw et al. (2019), vegetables are important for income generation to a large proportion of the rural households. Enhancing tomato farmers to reach markets and actively engage in the markets is a key challenge influencing tomato production in Ethiopia.

Commercial farms in Ethiopia are used to grow vegetables over a considerable land area for years (Kassaw et al., 2021). According to Central Statistical Agency (2020) vegetables took up about 1.62 % of the area under all crops at national level in Ethiopia indicating that, of the total estimated area under vegetables, the area under tomato production was only 2.5 % from and the area under tomato production was estimated to 0.05 % at the national level in Ethiopia. This figure shows that, out of the total land area under cultivation in Ethiopia, land allocated for tomato production is insignificant as compared to other crops at the national level. In general, out of the total land area under cultivation in Ethiopia, land under tomato production is insignificant compared to food crops. Therefore, there is a strong need to estimate the factors that affect market orientation among tomato producers in Ethiopia in general and in the study area in particular.

This study was an attempt to fill the knowledge gap of smallholder tomato producers by identifying the determinants of market orientation, the status of marketing performance along the market chain, and the marketing challenges in the study area to provide information for future planning and policy intervention in production and marketing among smallholder tomato producers in the country.

2. LITERATURE REVIEW

Ethiopia has a good potential in the production of vegetables; the aim of production is mainly for subsistence, with less market-oriented activities, and with very weak market linkage- production (Megerssa et al., 2020).

Market orientation has taken its own place in marketing thinking and business operations of manufacturing firms. Market orientation of farmers is an ultimate result of agricultural commercialisation. It requires access to emerging high-income agricultural markets for buying input and selling output (Osmani & Hossain, 2016).

According to Demeke & Haji (2014), farmers in Ethiopia face the challenge of subsistence food production and traditional activities that did not fully use available land and labor, and hence it contributes to low market orientation in land allocation. According to Schneider & Gugerty (2010), market oriented production allows smallholder producers to increase their income by producing products from land and labor and using the income generated from sales to purchase goods for consumption. However, research on market orientation in Ethiopia has mainly focused on cereals and pulse crops. Household livelihood requirements, market access and production factors including land, labor and capital affect market orientation of smallholder farmers in Ethiopia (Gebremedhin & Jaleta, 2012).

The market orientation of smallholder tomato producers in our study area is a critical factor that influences their success and livelihoods. However, despite the importance of market orientation, there is a lack of comprehensive understanding regarding the determinants that shape smallholders' market orientation in this specific context. This knowledge gap hampers the development of targeted interventions and policies to enhance market orientation of smallholder farmers and improve their access to profitable market channels. Therefore, there is a need for a systematic investigation into the factors that drive or hinder market orientation among tomato producers in these districts to inform evidence-based strategies for sustainable agricultural development. By addressing this research gap, policymakers, agricultural extension officers, and development practitioners can support smallholder farmers in enhancing their market orientation, thereby contributing to poverty reduction and overall economic growth in the region. Moreover, despite tomato production and marketing is economically important commodity of small holder producers in our study area; insufficient regulation of the price of tomatoes where traders and brokers set their own price, usually below the market price, harms the income of tomato producers and discourages their production and marketing, hence, this has a direct effect to decrease the income of producers and country's income that should have been obtained from tomato production. Farmers are selling their produce with lower price, and this reduces the income received from the tomato farming in the study area; due to this problem, market orientation of farmers to allocate more of their resources to tomato production has decreased. Therefore, to benefit tomato farmers from production and market supply, the tomato marketing system must operate efficiently. Hence, it is fundamental to examine the performance of producers along the tomato market chain to improve their efficiency in production and marketing and the challenges or constraints of tomato marketing faced by farmers in the study area.

In this study, we formulated the following research hypothesis as follows:

1. Family size, wage paid for daily labourers in tomato farming activity have a negative effect on farmers' market orientation.

2. Farming experience, access to credit, access to improved seed, farm size positively affect smallholder tomato producers' market orientation.

3. Producers share higher gross marketing margin than collectors and wholesalers along tomato marketing chain.

Moreover, we also articulated the following research questions:

1. What are the factors affecting market orientation of smallholder tomato producers in the study area?
2. Who are the actors along the tomato marketing chain?
3. Who is more benefited along the market channel of tomato marketing?
4. Who is in a bad position in sharing of marketing margin?

3. METHODOLOGY

In our research, we used a three-stage sampling technique to select representative smallholder tomato producers from Arsi Zone, Oromia, Ethiopia. Firstly, Zewaydugda district was selected purposively based on its production potential. Secondly, a total of five kebeles, which are the smallest administrative unit in the country were randomly selected, and finally, a total of 191 sample respondents were randomly selected. We used kobo toolbox for collecting the data from our respondents, and then we transform the data to STATA version 16.

We analysed the level of crop marketability market of tomatoes and the market orientation of smallholder tomato producers by calculating the crop marketability market index and the market orientation index for each sampled household head during the study based on the resource they allocate to tomato production, since market orientation is also the decision of farmers in resource (land) allocation for production of a crop following (Abate et al., 2020). When crops are grown for dual purpose both for commercial and consumption due to proportion of land operated by a farmer, farmers have different market orientation index depending on their resource allocation (land) for the commodity they produce. Based on the proportion of total amount sold to total production at farming system level, a crop specific marketability index (α_k) was computed for tomato produced at farmer level system as follows:

$$CMI_i = \left[\frac{Gross\ value\ of tomat\ \ sold\ (GVS)\ by\ individual\ farmer}{Total\ value\ of\ tomato\ produced\ (GVP)\ by\ individual\ farmer}\right], \quad (1)$$

where CMI_i refers to tomato marketability index for individual farmer in 2020/2021 production year.

$$\alpha_k = \frac{\sum_{i=1}^{N} S_{ki}}{\sum_{i=1}^{N} Q_{ki}} Q_{ki} \geq S_{ki}\ and\ 0 \leq \alpha_k \leq 1, \quad (2)$$

where α_k is the proportion of tomatoes (S_{ki}) to the total amount of tomatoes produced (Q_{ki}) aggregated over the total sample households in a farming system.

The α_k takes a value between 0 and 1, inclusive of the value between 0 and 100 % if it is converted into percentage. A value of zero would mean a totally subsistence level of market orientation in production and the closer to 100 the index indicates higher in market orientation in production. After we calculated the crop

specific marketability index, the household's market orientation index in land allocation (MOI_i) was calculated (equation 3) from the land allocation pattern of the household weighted by the marketability index (α_k) of the crop (tomato) derived from equation 1.

$$MOI_i = \frac{\sum_{k=1}^{k} \alpha_k L_{ik}}{L_i^T} L_i^T \geq 0 \; and \; 0 < MOI_i \leq 1, \quad (3)$$

where MOI_i is market orientation index of farmer;

L_{ki} is amount of land allocated for tomatoes in hectare;

L_i^T is the total crop land operated by farmer measured in hectare.

The higher proportion of land a household allocates to the more marketable crops, the more the household is market oriented.

To analyse marketing performance or marketing margin of the actors involved in tomato marketing chain, following similar steps with Weldeyohanis et al. (2017) and hence the marketing margin was calculated by taking the difference between tomato producers and retail prices (Mendoza, 1995).

This can be calculated mathematically as, the ratio of producers' price to consumers' price and can be expressed as:

$$Producers' \; share = \frac{Producers' \; price}{Consumers' \; price} = 1 - \frac{Marketing \; margin}{Consumers' \; price}. \quad (4)$$

Secondly, we also calculated the gross market margin (GMM) of individual actors and the marketing margin was calculated at a given by:

$$GMM = \frac{Retail \; price - Farm \; gate \; price}{Retail \; price} \cdot 100, \quad (5)$$

where *GMM* – growth marketing margin.

Thirdly, we calculated the total gross marketing margin (TGMM) which is the difference between producer's (farmer's) price and consumer's price (price paid by final consumer) and was calculated as follows:

$$TGMM = \frac{Consumer \; price - Producer \; price}{Consumer \; price} \cdot 100. \quad (6)$$

Furthermore, we also calculated the net marketing margin (NMM) which is the percentage over the final price earned by the intermediary by deducting the marketing as follows:

$$NMM = \frac{Gross \; marketing \; margin - Marketing \; cost}{Consumer \; price} \cdot 100. \quad (7)$$

4. RESULTS

Table 1 presents the crop marketability index of tomato farming and the average value of farmers' market orientation index in tomato production. The total land operated by tomato producers was 394.65 hectares whereas the land allocated such crop was 140.86 hectare. Furthermore, the total tomatoes produced and sold during the production year were 34,785 and 28,833 quintals respectively and the average selling price of tomato was 1143.2 Birr per quintal.

Table 1

Crop marketability index and market orientation index of tomato producers

Variables		Measurement units		Quantity	
Total production		Quintal		34785	
Volume of sold		Quintal		28833	
Average quantity of sold tomatoes		Quintal		150.96	
Total land operated		Hectare		394.60	
Land allocated		Hectare		140.86	
Average selling price		Birr/Quintal		1143.2	
Gross sales value of tomatoes		Birr		32,961,885.6	
Total value (cost) of tomato production		Birr		39,766,212.0	
Crop marketability index (CMI)		-		0.8289	
Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Market orientation index (MOI)	191	0.3054	0.2502	0.0178	0.9833

Source: authors' calculation from survey result of 2022 in the study area.

In our study, the analysis of the crop specific marketability index indicates that 82.89 % of total production is sold by the households in the study area. Thus, the degree of marketability of the crop is considered highly commercialised as their sales percentage exceeds than the threshold level 75 % according to Ohen et al. (2013), who found that, farmers (small or large) are considered commercial if they sell more than 75 % of their total production. Tefera (2014), who conducted a research on determinants of market orientation of smallholder pulse producers in Southern Ethiopia in 2014 found that the average level of market orientation index for haricot bean was 0.40 and for chickpea 0.53 and he concluded that the level of household market orientation as moderate level. In our study, the average market orientation index of smallholder tomato producers was 30.54 % which indicate that smallholder tomato producers are moderately market orientated in tomato production at the study area. This result is in line with Gebremedhin & Jaleta (2012), who conducted a study on market orientation of smallholders in Ethiopia, and they found an average market orientation index of 29 % and classified the level of farmers' market orientation as the moderately market orientated.

We also analysed the determinants of market orientation of smallholder tomato farmers in tomato production using an econometrics model of multiple linear regression model of Ordinary Least Squares (OLS) estimation method. Following Abate et al. (2020), market orientation index is modelled as a function of different socio-economic factors to see how the factors affect the level of market orientation. The functional form is as follows:

$$MOI_i = f(X)_i, \quad (8)$$

where MOI_i – market orientation index or the level of market orientation;

X_i – assumed socio-economic factors that affect the level of market orientation. Therefore, a specified regression model is also formulated as follows:

$$MOI_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + u_i, \quad (9)$$

where β_0, β_1, ... β_7 are parameters to be estimated;

X_1, X_2, ... X_6 are the explanatory variables that affect the level of market

orientation;

u_i is the stochastic error term.

The regression equation (9) shows a linear relationship between dependent variable and explanatory variables and the equation is estimated using OLS method. The explanatory variables that are used in the regression are shown in Table 2.

Table 2

Specification of the explanatory variables for multiple regression models

Explanatory variable	Types of variable	Measurement	Expected sign
X_1 – Farming experience	Continuous	Total years in tomato production	+
X_2 – Family size	Continuous	Number of person in the house	-/+
X_3 – Access to credit	Dummy	1 – Yes; 0 – No	+
X_4 – Access to improved seed	Dummy	1 – Yes; 0 – No	+
X_5 – Land allocated (Farm size)	Continuous	Farm size of tomato in hectare	+
X_6 – Wage of labour	Continuous	Average wage in Birr	-

Source: authors' computation.

Table 3 presents the descriptive statistics for independent variables used in econometric regression. The result of descriptive statistics showed that, the average farming experience of smallholder tomato producers was 6.97 years in tomato production whereas the average family size of the sampled households was 6.19 persons per household. The survey results also revealed that, the mean land size allocated for tomato production of sampled households is 0.74 hectare per household which is aligns with previous research conducted in Ethiopia, which found that smallholder farmers typically owned less than 2 hectares of land for agricultural purposes (Abate et al., 2020; Rapsomanikis, 2015). At the same time, the average farm size of a household in Ethiopia is 1.22 hectares (Bezu & Holden, 2014). The average daily labour cost paid for labourers for tomato production was 121.83 Birr at the farm level (Table 3).

Table 3

Descriptive statistics of variables used in the model

Continuous variable	Observation	Mean		Std. Dev.
Farming experience	191	6.97		6.90
Family size	191	6.19		3.03
Land allocated (Farm size)	191	0.74		1.06
Wage of labour	191	121.83		42.66
Dummy variable	Observation	Response	Frequency	Percent
Access to credit	191	No	150	78.53
		Yes	41	21.47
		Total	191	100.00
Access to improved seed	191	No	90	47.12
		Yes	101	52.88
		Total	191	100.00

Source: authors' computation from survey result of 2022 in the study area.

Furthermore, from the total household sampled for our study, only 21.47 % of the them has access to credit service for the tomato production while the majority

(78.53 %) did not have any access to credit service in the study area. About 47.12 % of the respondents has not any access to improved seed of tomato in the study area (Table 3). Using the above explanatory variables, we regressed the average market orientation index of the respondents using OLS estimation method to identify the factors affecting farmers' market orientation in tomato production in the study area. Table 3 presents the results from the OLS estimation of the determinants of market orientation of smallholder farmers of tomato producers in the study area.

The model F-tests applying appropriate degrees of freedom indicate that the overall goodness of fit of the OLS model is statistically significant at 1 %, and the value (R-squared = 0.3644) indicates that the independent variables included in the OLS model regression significantly explain the variation in the market orientation of tomato producers in the study area by 36.44 % during the production year.

The results indicate that the extent of market orientation is significantly determined by family size, access to credit service, access to improved seed of tomato, and farm size used in tomato production. That is, these variables have stronger numerical effects on market orientation of tomato production.

According the results shown in Table 4, family size of the household has negative relationship with market orientation of smallholder tomato producers in the study area. It is found that there is a strong significant and negative relationship between family size and market orientation in the study area i.e. (β = -0.0262; P = 0.000). This indicates that if farmers' family size is increased by one person, the farmers' market orientation index will be decreased by 0.026 at 1 % significance level. This explain that a 1 % increase in family size decreases the farmers' market orientation in tomato production by 2.62 % which is in line with the findings of Abate et al. (2020), who stated that as the family size increased by one adult equivalent, the probability of being market oriented would be decreased by 14.53 %, ceteris paribus.

Table 4

OLS estimation results for determinants of market orientation

Variable	Coefficient	Robust Std. Err.	t	P>|t|
Farming experience	0.0005	0.0021	0.23	0.819
Family size	-0.0262***	0.0066	-3.99	0.000
Access to credit	0.0754**	0.0367	2.06	0.041
Access to improved seed	0.0623**	0.0312	2.00	0.047
Land allocated (Farm size)	0.1112***	0.0229	4.86	0.000
Wages for labour	-0.0001	0.0004	-0.20	0.838
Constant	0.3423	0.0574	5.96	0.000
Obs. = 191; F(6.184) = 16.98; Prob > F = 0.0000; R-squared = 0.3644; Root MSE = 0.20268				

Note. *** and ** indicate 1 % and 5 % significance levels, respectively.

Source: authors' calculation from the survey result of 2022 in the study area.

Access to credit service has significant and positive effect in inducing market orientation for tomato smallholder farmers. The results of OLS estimation show that farmers' access to credit service correlate significantly and positively with the market

orientation in the study area i.e. ($\beta = 0.0754$; $P = 0.041$). This explains that smallholder farmers' market orientation is increased by 7.54 %, if they have access to credit services. This results of study are in line with Weldeyohanis et al. (2017), who reports that as farmers' access to credit services increase by 1 % their market orientation in malt barely production increases by 1.52 % in Arsi Zone of Ethiopia. Moreover, the current findings are consistent with Tefera (2014), who reports that increase in farmer's access to credit increases in the level of chickpea producer's market orientation in southern region of Ethiopia.

Access to improved tomato seed is also important determinant of market orientation of smallholder tomato producers and it has positive and significant effect on farmer's market orientation. The result indicates that farmers' access to improved seed ($\beta = 0.0623$; $P = 0.047$) correlates significantly and positively with the market orientation in the study area as and the findings revealed that market orientation of smallholder farmers is increased by 6.23 %, if they have access to improved tomato seed. This is because the use of improved seed should be effective in producing tomatoes of high quality and quantity due to the high demand and possible higher selling price for the crop. This result is in line with the findings of Weldeyohanis et al. (2017), who conducted a research in Arsi Zone to identify the factors affecting market orientation of malt barley smallholders producers and who found that access to improved seed has positive and significant effect on farmer's market orientation indicating that as the probability of access to improved seed increase by 1 %, market orientation of farmers increases by 1.6 %.

Furthermore, the result of OLS estimation found that, there is a strong significant and positive relationship between farm size and market orientation in the study area i.e. ($\beta = 0.1112$; $P = 0.000$). This indicates that if farmers' farm size is increased by one hectare, market orientation index will be increased by 0.1112 at 1 % significance level. It may be a fact that farm households with large farm size could allocate their land for tomato production giving them better position to participate in the output market. It explains that at 1 % significance level, farm households' market orientation increases by 11.12 % if they use 1 % more land for cultivation by using improved seeds. This study is in line with Abate et al. (2020), who shows that the larger size of land is allocated for wheat production, the more likely to be a market oriented wheat farmers due to the highest wheat production that led farmers to supply more and produce based on market signals in Ethiopia. Furthermore, our finding is also in line with the study by Onubuogu & Onyeneke (2012), who reports that, an increase in farm size cause an increase in market orientation of root and tuber crop production at Imo State of Nigeria.

In our study, we also assessed the alternative marketing channels followed by farmers in selling their produce to different outlets. Table 5 shows alternative marketing channels that the farmers used to sell their produce by sample producers in the study areas. As the starting point for the distribution of tomatoes from the producer to final consumer, respondents were asked where they sold tomato products produced during the production year (Table 5).

Table 5

Alternative marketing channels for tomato output by sample respondents

Variable	Market channels Farmers to:	Response (N = 191)	
		Frequency	%
Alternative market channels	Consumer	8	4.19
	Collector	6	3.14
	Wholesaler	112	58.64
	Processor	3	1.57
	Consumer and collector	11	5.76
	Consumer and wholesaler	28	14.66
	Collector and wholesaler	6	3.14
	Consumer, collector and wholesaler	17	8.90
	Total	191	100.00

Source: authors' computation from survey result of 2022 in the study area.

According to the respondents' result of smallholder tomato producers, about 58.64 % of them sell their tomatoes to wholesaler followed by consumer (4.19 %) and collector (3.14 %) respectively. Furthermore, about 14.66 % of the respondents sell their tomatoes to consumer and wholesaler, about 5.76 % of them sell to consumer and collectors and 8.90 % of them sell their produce to consumer, collector and wholesaler market channels at the same time (Table 5).

Based on the survey result (Table 5), we developed the market channel map for tomato marketing and from the drawn map, we identified about 8 channels. These includes: producers to consumers; producers to collectors; producers to wholesalers; producers to processors; producers to consumers and collectors; producers to collectors and wholesalers; producers to consumers and wholesalers; producers to collectors and wholesalers, and producer to consumers, collectors and wholesalers which are drawn from the market channel map of tomato (Figure 1).

Below are the eight marketing channels we have identified in the tomato market channel map. We also calculated the total quantity of tomato passed through each channel based on Table 5. These are the following:

Channel 1: Producer to consumers (1,207.68Qt = 4.19 %);

Channel 2: Producer to collectors (905.76Qt = 3.14 %);

Channel 3: Producer to wholesalers (16,907.52Qt = 58.64 %);

Channel 4: Producer to processors (452.88Qt = 1.57 %);

Channel 5: Producer to consumers and collectors (1,660.56Qt = 5.76 %);

Channel 6: Producer to consumers and wholesalers (4,226.88Qt = 14.66 %);

Channel 7: Producer to collectors and wholesalers (905.76Qt = 3.14 %);

Channel 8: Producer to consumers, collectors & wholesalers (2,566.32Qt = 8.90 %).

As it was shown on Figure 1, from the total 34,785 quintal produced by sample respondents in the study area (Ziwaydugda district), about 28,833 quintal of tomatoes were supplied by 191 sample farmers to different buyers of tomatoes and the average quantity of tomatoes supplied by individual farmer is 150.96 quintal (see Table 1 and Figure 1).

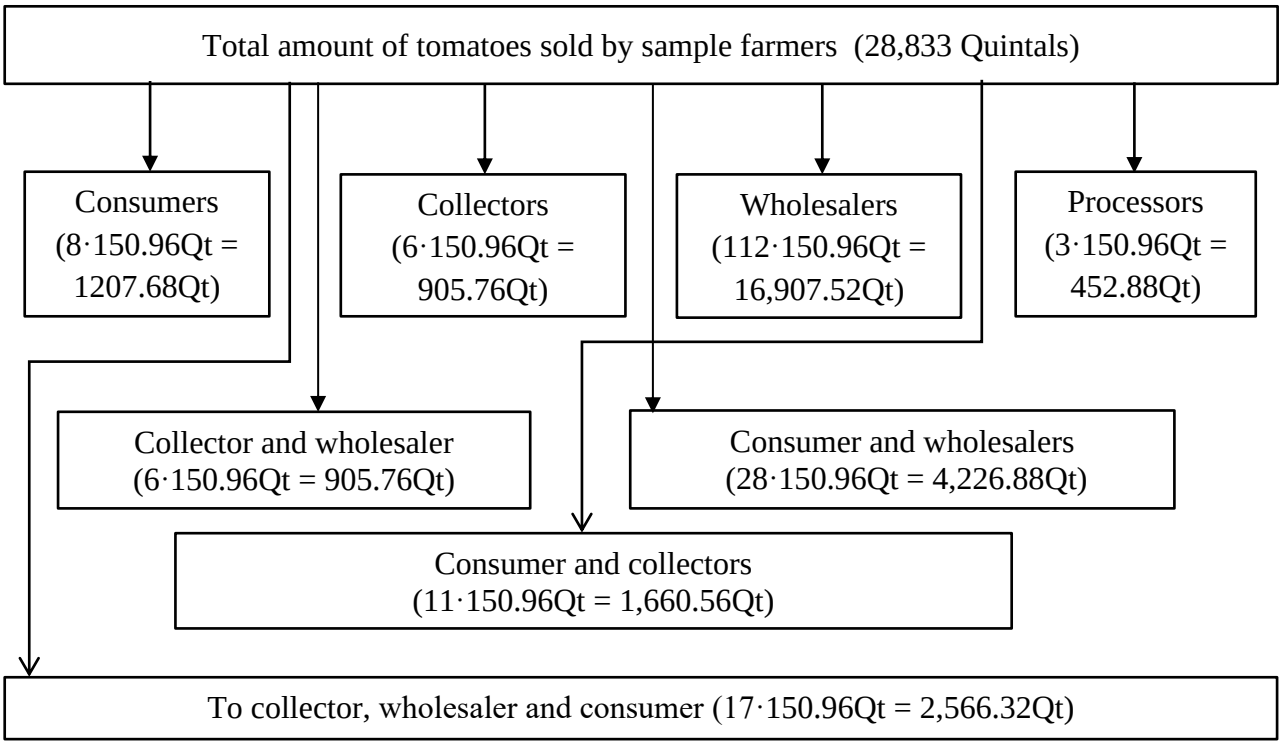

Figure 1. Marketing channels map for quantity supplied of tomato to the market

Note. Qt refers to quintal.

Source: authors' computation from the survey result of 2022 in the study area.

As it was shown on the Figure 1, the main buyers of tomato from producers were wholesalers, consumers, collectors, and processors with an estimated percentage of 58.64 %, 4.19, 3.14 and 1.57 % respectively and actual quantity of 16,907.52Qt, 1,207.68, 905.76 and 452.88Qt as it was shown on channel 3, channel 1, channel 2 and channel 4 respectively. Furthermore, farmers were in charge of selling their produce to different buyers as the same time. The survey result showed, that about 5.76 % (1,660.56Qt) of tomatoes are sold to consumers and collectors (channel 5), 14.66 % (4,226.88Qt) of the tomatoes produced were sold to consumers and wholesalers (channel 6), about 3.14 % (905.76Qt) were sold to collectors and wholesalers (channel 7), and about 8.9 % (2,566.32Qt) were sold to three tomato marketing actors namely consumers, collectors & wholesalers (channel 8).

In our study, we also analysed the benefit share (marketing margin) of the major actors along the market chain of tomato marketing (Table 6) using market performance analysis method; and we measured the market margin of producers and other market actors using the price differences of sales prices and average costs of commodity at each stage of the market chain to describe economic fitness of major actors across the chain.

Table 6 presents the marketing margin of actors along the tomato market chain. The total cost incurred by retailors was the highest of all actors followed by wholesalers and collectors while producers incurred the lowest cost as compared to the others market participants along the tomato market chain in the production year.

Table 6

Cost and marketing margin distribution of actors along the tomato market chain

Marketing margin analysis of tomato marketing chain actors				
Items (Ethiopian Birr per Quintal)	Producers	Collectors	Wholesalers	Retailors
Production cost	368.14	0	0	0
Marketing cost	-	-	-	-
1.1. Loading / unloading cost	0	100	100	100
1.2. Transportation cost	0	150	150	50
1.3. Loss	0	43.75	59.25	30.25
1.4. Processing cost	0	0	0	0
1.5. Commission fee	0	0	15	0
1.6. Tax	0	0	25	0
Total marketing cost	0	293.75	349.25	180.25
Purchase price	0	1143.21	1655.69	2275.48
Total cost	368.14	1436.96	2004.94	2455.73
Average selling price	1143.21	1655.69	2275.48	2980.88
GMM (%)	38.36	17.19	20.79	23.66
NMM (%)	26.00	7.34	9.08	17.62
TGMM (%) = 61.64				

Source: authors' calculation from the survey result of 2022 in the study area.

As it was shown in Table 6, the market performance analysis of marketing actors in tomato market chain revealed that, about 61.64 % of the TGMM belong to the traders while the rest 38.36 % – to producers. Here, the total gross margin of traders is almost twofold of the producers. Specifically, of the total marketing margin of tomato market chain actors, producers have the largest share of GMM with respective value of 38.36 % followed by retailers and wholesalers (with GMM of 23.66 and 20.79 % respectively while the rural collectors (assemblers) shares the least GMM with the respective values of 17.19 % during the production year.

Furthermore, we calculated the share of profit of actors (NMM) in tomato market chain, and the result show that producers and retailors got the highest share of profit margins with respective value of 26.00 and 17.62 % respectively followed by wholesalers (9.08 %) while local collectors share the least net profit margin with respective values of 7.34 % in the production and marketing year.

Finally, we assessed and identified the marketing challenges faced by tomato producers by ranking the problem as 1st, 2nd, 3rd, … and 8th. Marketing problems are factors that cause market inefficiencies. Market inefficiencies will lead to hosting unsatisfied customers, and high marketing costs.

Table 7 presents tomato marketing challenges which affects the marketing activity in the study area. In this study, sampled farmers were asked about the presence and types of marketing problems. Out of the total 191 respondents of tomato producers, 100 % of the them faced with marketing problems. The types of marketing problems they faced were listed from the most problematic factor to the least problematic one.

Accordingly, poor communication with value chain actors (27.75 %), lack of

fair sales price due to brokers (18.32 %), lack of market (13.09 %), lack of transport (9.95 %), low price of the product (9.42 %), perishability of the product (5.76 %), lack of market information (5.24 %), and lack of storage (5.24 %) are subsequent marketing problems or challenges of farmer or tomato producers in the study area (Zewaydugda district).

Table 7

Tomato marketing problems/challenges of the study area

Variable	Tomato producers (N = 191)		
	Frequency	Percent	Rank
Poor linkage with value chain actors	53	27.75	1st
Brokers hinder fair sales price	35	18.32	2nd
Lack of market	25	13.09	3rd
Lack of transport	19	9.95	4th
Low price of the product	18	9.42	5th
Perishability of the product	11	5.76	6th
Lack of market information	10	5.24	7th
Lack of storage	10	5.24	8th
Total	191	100.00	-

Source: authors computation from survey result of 2022 in the study area.

Recent studies in Ethiopia have also identified similar marketing constraints affecting vegetable and potato producers. For example, in a study conducted by Zewdie & Ketema (2019) in the West Gojam Zone of Ethiopia found that distance to nearest market centre, experience, access to credit and market information were key constraints affecting potato producers. Therefore, we agree that governmental and non-governmental organisations should be involved in filling the gaps between the various actors in the market chain through their intervention, especially in relation to market information (Zewdie & Ketema, 2019).

5. DISCUSSION

In our study, we investigated the market orientation of smallholder tomato producers. The results showed that the average market orientation index for these producers was recorded at 30.54 %. This finding suggests that smallholder tomato producers in the study area exhibit a moderate level of market orientation in tomato production. Our results align with a previous study conducted by Gebremedhin & Jaleta (2012), which examined the market orientation of smallholders in Ethiopia.

These findings provide valuable insights into the market orientation of smallholder tomato producers in our specific study area. The observed moderate level of market orientation means that these producers have a certain degree of awareness and consideration for market dynamics in their tomato production practices. This indicates that they are attuned to market signals and are responsive to market demands to a reasonable extent.

It is important to note that market orientation plays a crucial role in the success and competitiveness of agricultural enterprises, as it allows farmers to adapt their production strategies and practices to effectively meet market requirements.

However, further research is needed to further explore the specific factors influencing the market orientation of smallholder tomato producers and explore potential areas for improvement.

This study expands the theoretical framework of households' economics (Koblianska et al., 2022) and the functioning of the tomato market (Chanda et al., 2021; Rantlo et al., 2021). Overall, our study contributes to the understanding of market orientation among smallholder tomato producers and underscores the need for targeted interventions and support mechanisms to enhance their market orientation levels. By improving market orientation, smallholder farmers can potentially achieve better market access, higher productivity, and increased profitability in tomato production.

The research findings indicate that in the studied area, family size, access to credit services, and access to improved tomato seed are important factors influencing market orientation of smallholder tomato producers. The negative relationship between family size and market orientation indicates that as the family size of farmers increases, their market orientation decreases. This means that larger families may face constraints in terms of resources and capacity to engage effectively in market-oriented practices. On the other hand, access to credit services positively impacts market orientation, with smallholder farmers experiencing a 7.54 % increase in market orientation if they have access to credit. This means that credit availability allows farmers to invest in their production, marketing, and overall business activities, leading to a more market-oriented approach.

Additionally, access to improved tomato seed positively influences market orientation, as farmers experiencing such success report 6.23 % increase in market orientation. This is likely due to the improved seed ability to enhance both the quality and quantity of tomato production, enabling farmers to meet the demands of the market and potentially demand higher prices for their crops. Overall, these findings highlight the significance of family size, access to credit, and improved seed in shaping smallholder tomato producers' market orientation in the study area, providing valuable insights for agricultural policies and interventions aimed at promoting market-oriented farming practices.

The researchers suggest that farm households with larger farm sizes have an advantage in participating in the output market. This could be attributed to their ability to allocate more land for tomato production, which puts them in a better position to respond to market signals and supply larger quantities of tomatoes. The study implies that increasing farm size by 1 % and using improved seeds could lead to 11.12 % increase in market orientation at the 1 % significance level. In summary, our research results show that increasing farm size positively influences market orientation in the study area.

The market performance analysis of marketing actors in the tomato market chain revealed some interesting findings. According to the study, approximately 61.64 % of the TGMM belong to the traders, while the remaining 38.36 % – to the producers. This means that the traders have a significantly larger share of the gross margin,

almost double that of the producers. Among the various actors in the tomato market chain, the producers hold the largest share of the GMM, accounting for 38.36 %. The retailers and wholesalers, who respectively have GMM values of 23.66 and 20.79 %, follow them. Surprisingly, the rural collectors or assemblers have the smallest share of the gross marketing margin, standing at 17.19 % during the production year.

The study also calculated the share of profit of the actors (NMM) in the tomato market chain, which could provide further insights into the profitability distribution. These findings highlight the unequal distribution of profits within the tomato market chain, highlighting the disproportionate advantage in favour of the traders, while the producers receive a comparatively smaller portion. This research highlights the need to address the imbalance in profit distribution and suggests exploring strategies to ensure a fairer distribution of economic benefits among the various actors involved in the tomato market chain.

This research was limited in the study area and lacked many detail investigations that could enhance understanding of the whole system especially in relation to production and consumption studies. Moreover, logistics and inaccessibility of some respondents from producers due to scattered production were a challenge during survey. Furthermore, the scope of the study was limited to only one district, so its results cannot be generalised to Ethiopia as a whole.

6. CONCLUSIONS

The present study examines the market orientation determinants, and marketing performance of smallholder tomato producers in Zewaydugda district of Oromia regional state of Ethiopia.

The calculation of household market orientation index revealed that on the average, farm households allocate 30.54 % of their cultivable land to the production of tomato and it showed that farmers in the study area are nearly moderately market orientated in tomato production. The crop marketability index showed that 82.96 % of the produced crop (tomatoes) is supplied to the market. Thus, there is need to focus attention on improving tomato market orientation among the producers suggesting that tomato is an important component of the household cash source at the study area.

The econometrics result of OLS estimation showed that access to credit, access to improved seed, and land size of tomato production are the explanatory variables affecting market orientation of tomato producers significantly and positively; hence, promoting these factors increases market orientation of farmers in resource allocation for tomato production among the producers in the study area. Moreover, family size in the house was found to be significantly and negatively affecting market orientation of tomato producers. Hence, promoting family planning among the farmers will increase their market orientation in tomato production in the study area.

The study identified that farmers had about eight major marketing channels while selling their produce, where the larger value (58.64 %) of tomatoes went through channel producer to wholesalers, which was about 16,907.52 quintals from the total, supplied to the market. This means that wholesalers are the major buyers of

the crop in the study area.

The market performance analysis showed that the smaller value of total gross marketing margin (38.36 %) goes to producers while the larger value (61.64 %) – to the traders indicating that there is higher price difference among tomato producers and traders in the study area where producers receive lower profit. The findings of market performance highlight the need for interventions and policies to address the unequal distribution of costs and market margins in along the potato market chains in the study area. Therefore, efforts to strengthen the bargaining power of smallholder farmers and improve their access to markets should be prioritised to ensure a more equitable distribution of benefits along the value chain.

Generally, our findings indicate that poor communication with other actors in value chain, lack of fair sales price due to brokers, lack of market, lack of transport, low price of the product, perishability of the product, lack of market information, and lack of storage were identified as the dominant marketing problems for tomato marketing in the study area.

Based on the findings of the research, the following recommendations are offered. Commercialisation approach that would encourage farmers to dedicate more of their cultivable land for tomato production, to get adequate access to credit and access improved seed services for all smallholder farmers should be adopted by government to increase market orientation of farmers. In addition, policy promoting market-oriented crop production technologies and further research on other determinants of market orientation should be done in the study area. Generally, policies focusing on reducing illegal brokers, increasing awareness of farmers to allocate more cultivable land, reducing the price difference among producers and traders, enhancing farmers to get access to credit and access to improved seed, strengthening market linkages among the value chain actors should be implemented to improve market orientation of smallholder tomato producers and marketing performance to the study area in particular and at the country level in general.

7. LIMITATIONS AND FUTURE RESEARCH

Given that our study was conducted in one district of the country, it is challenging to make broad generalisations about Ethiopia as a whole. However, it is essential to acknowledge the limitation of our research scope and highlight the need for further studies to assess the applicability of our findings at a national level. By highlighting the specific district where the study took place and the specific population it targeted, we can accurately represent the context in which our conclusions are valid. Caution should be exercised when extrapolating the results to other regions or the entire country, recommending that future research include a more diverse sample and a wider geographical representation. Future research should be conducted on the following issues: (1) factors affecting the gross market margin reduction of tomato producers in Ethiopia; (2) value chain analysis of tomatoes in Ethiopia to identify the constraints and possible interventions from production to consumption level of tomatoes at country level in Ethiopia.

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