



Tomato value chain in Southwest Nigeria: An assessment of economic performance

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Abstract

The study was conducted to assess the economic performance of the tomato value chain in Southwest, Nigeria. A purposive sampling technique was used to select 24 communities in the study area, while simple random sampling techniques were used to select two tomato input sellers, 2 producers, 2 processors, 2 marketers and 2 consumers. In all 240 tomato value chain actors were selected for the study. Descriptive statistics, budgetary analysis and multiple regression analysis were employed to analyze the data. The results showed that the majority of the tomato value chain actors were married and educated with a mean age of between 38 and 49 years old. The result of the budgetary analysis revealed that the value of the return on investment (ROI) of the producers, input suppliers, marketers and processors were 0.54, 0.94, 0.44 and 0.49 respectively. This implies that the tomato business is profitable to all the actors. However, the input suppliers made more profit than other actors in the tomato value chain. The result of the multiple regression revealed that gender, marital status, age, household size, years of education and cost of inputs were the major factors that influenced the profitability of the actors. The major constraints faced by the value chain actors in the study area were identified among others to be price fluctuation, incidence of pest attacks, lack of capital, high cost of inputs, high cost of transportation, high cost of labour, threats from adulterated processed tomatoes, unorganized market and perishability nature of tomatoes. It is therefore recommended that relevant government agencies such as the Standard Organization of Nigeria (SON) should be encouraged to efficiently monitor tomato value chain processes to improve the health benefits of the produce (tomato) and its products.

Keywords: Economic performance, Southwest Nigeria, Tomato, Value chain



Introduction

Tomato is scientifically known as *Solanum lycopersicum* with the synonym *Lycopersicon esculentum* and also belongs to the family of *Solanaceae*, a family of common vegetables. The crop originated in South America and was introduced to Europe in the 16th century and later to East Africa by colonial settlers in early 1900 (Bortolot, 2003). Tomato plays an important role in solving problems of unemployment; providing income, and increasing food and nutritional requirements. Majorly, the crop is sold fresh from the farm gate and marketed for human consumption or to the final consumer. There is a significant interstate trade in tomatoes in Nigeria. Tomatoes are transported over long distances from the North where they are largely cultivated (Adenuga et al., 2013) to the South to meet the demand of the final consumers. The significance of tomatoes to human health and especially their nutritional contents made it necessary to address the issue of their economic performance. Therefore, its availability accessibility and consumption show great potential to alleviate vitamin deficiencies in the mean (FAO, 2013). Tomato is one of the most important staple foods in Nigeria when it comes to making soup (stew) for common household consumption.

Given the present level of poverty, food insecurity and under-nourishment in Nigeria, food losses and waste, which occur along the entire food value chain, need to be addressed (FAO, 2014; Ogunniyi and Oladejo, 2011). There is a huge production of tomatoes in Nigeria but more than 50% are lost after harvesting and handling (Aminu and Musa, 2005; Haruna et al., 2012). Tomato has no shelf life after ripening which necessitates the need for various value-addition activities of the produce (Ugonna et al., 2015). There are various steps involved in adding value to tomatoes after harvesting, transportation and handling periods. It is of good advantage to add value to tomatoes, the shelf life is increased and preserved and it becomes a high-standard product making it attractive to consumers concerning its durability characteristics (Tripathi et al., 2017). Some of the value addition operations include the following; sorting, washing, blanching, drained pulping, sieving, boiling and steaming, preservation, packaging, branding, marketing and distribution. Therefore, the objective of this study was to assess the economic performance of the tomato value chain in southwest, Nigeria.

Materials and methods

The study area

The research was conducted in the southwestern part of Nigeria, encompassing six states: Ondo, Ekiti, Lagos, Ogun, Osun, and Oyo (Figure 1). This region is situated between longitude 2° 31' and 6° 00' East, and latitude 6° 2' and 8° 37' North. Its climate is classified as tropical wet and dry, characterized by an



average annual rainfall ranging from approximately 1500 mm to 2000 mm in the derived savannah and humid forest zones. There are two distinct seasons in this area: the rainy season, typically spanning from April to October, and the dry season, which usually occurs from November to March. Agriculture is the primary occupation of the people residing in this region, employing approximately 75% of the population.

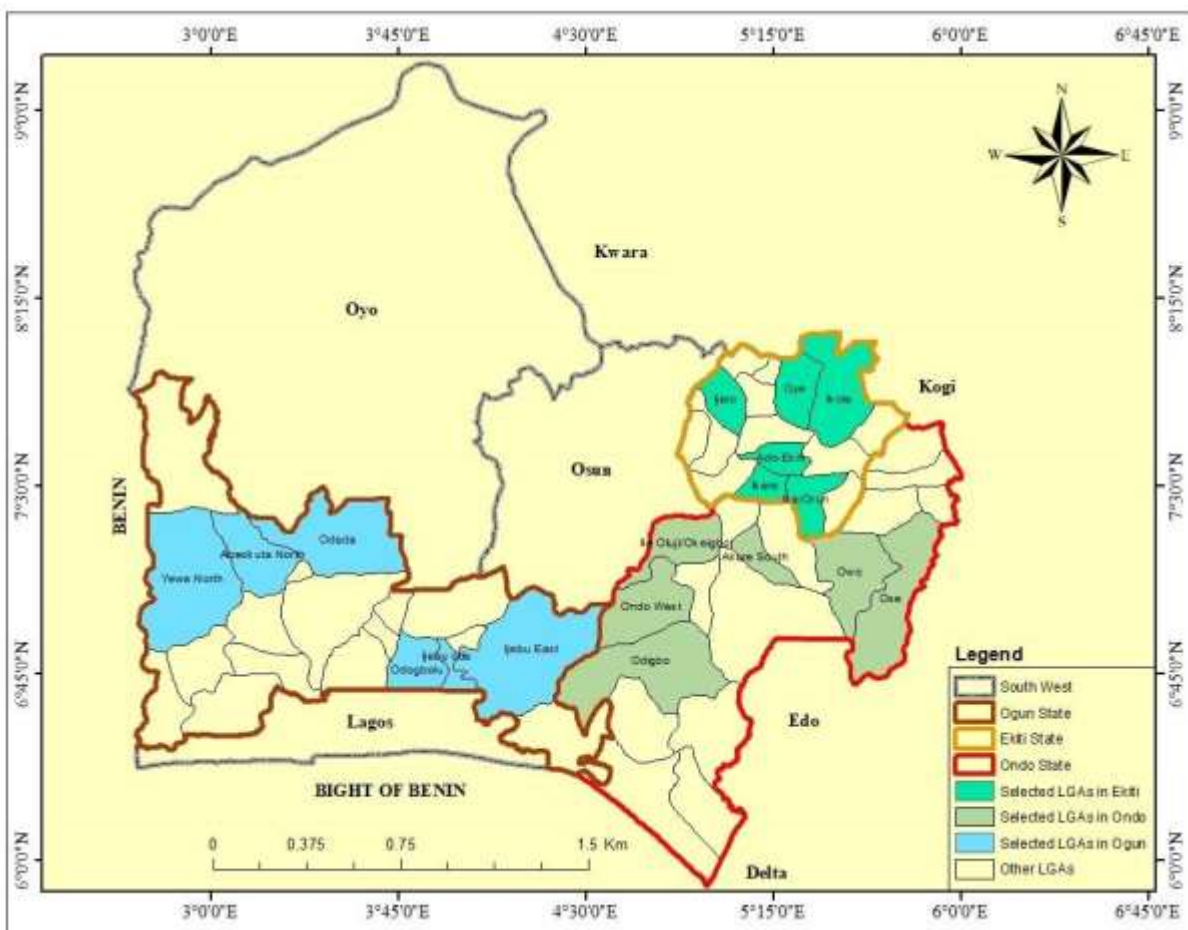


Figure 1. Map of the study area

Sampling techniques and sample size

The study population consisted of tomato input suppliers, tomato producers, tomato processors, tomato marketers, and consumers in the study area. A multistage sampling procedure was employed to select the value chain actors for the study. In the initial stage, three states, namely Ondo, Ekiti, and Ogun States, were purposively chosen from the six states in Southwest Nigeria. The second stage involved the purposive selection of three Local Government Areas (LGAs) from each of the three states where tomato business is prominent. In Ondo State, the selected LGAs were Odigbo, Akure South, and Owo. In Ekiti State, the



chosen LGAs were Ikere, Ado, and Ikole. In Ogun State, the selected LGAs included Abeokuta North, Odeda, and Ijebu Ode. In the third stage, two communities were randomly chosen from each LGA, resulting in a total of 18 communities. At the final stage, two input suppliers, two producers, two processors, two marketers, and two consumers were purposively selected from each community, yielding a total of 180 respondents.

Sampling techniques and data analysis

Primary data were obtained through a well-structured questionnaire. Multistage sampling techniques were used to select the respondents for the study. Data collected were subjected to descriptive statistics, budgetary analysis and regression model. Descriptive statistics such as frequency distribution, means, charts, and percentages were used to analyze the socio-economic characteristics of the respondents. Budgetary analysis was used to evaluate costs and returns on the tomato value chain while a regression model was used to analyze the factors affecting the tomato value chain in the area.

Budgetary analysis

Budgetary techniques are the analysis of costs and returns that were used to determine the economic performance of the tomato value chain in the study area.

Gross Margin - This is explicitly expressed as:

$$GM = \sum (PQ - rX)$$

P = Price of tomato (₦)

Q = Quantity of tomato in kg

r = Price of variable input

X = Quantity of variable input

Linear Regression Model - The marketing function postulated for the economic performance of the tomato value chain is presented in presented below.

The implicit equation is given as: $Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, e)$

Y = Annual income of respondents

X₁ = Age of respondents (Years)

X₂ = Gender distribution

X₃ = Marital status of respondents

X₄ = Family size

X₅ = Level of education

X₆ = Years of experience in tomato business

X₇ = level of tomato business (subsistence, medium and large scale)

X₈ = Sources of labour and e = Error term assumed to fulfill all assumptions of the classical linear regression model.

Results and discussion



Socioeconomic characteristics of the respondents

The results obtained from the socioeconomic characteristics of the respondents, as presented in Table 1, revealed that the majority of tomato producers, processors, and input suppliers were predominantly male, whereas the marketers were predominantly female. These findings align with the results of Fakayode et al. (2009), who attributed this gender disparity to the energy/physically demanding nature of tomato production, processing, and input supply. Furthermore, the results revealed that the mean age of the respondents ranged between 39 and 49 years, suggesting that the majority of tomato value chain actors are still in their economically productive age. These findings are consistent with the study conducted by Afolami and Ayinde (2004), which suggested that most tomato producers in their study area were still within an active age range conducive to prompt and effective decision-making. Moreover, the results revealed that 85%, 60%, 80%, 75%, and 75% of the marketers, consumers, producers, processors, and input suppliers, respectively, were married. This implies that the majority of the actors were married and could make joint decisions with their spouses regarding the success of their tomato businesses. Additionally, the mean household sizes were 3, 6, 5, 7, and 5 for the marketers, consumers, producers, processors, and input suppliers, respectively. This suggests that most tomato value chain actors have moderate household sizes, except for the processors who may employ family labour in their tomato processing operations.

Furthermore, the study findings indicated that all the tomato value chain actors were educated, which suggests that they would be capable of adopting new and improved innovations when introduced to them. This finding aligns with the results of Ugonna et al. (2015) in their study conducted in Nigeria. The results of the study further revealed that the mean years of experience were 9, 19, 8, 8, and 7 years for the marketers, consumers, producers, processors, and input suppliers, respectively. This implies that all the tomato value chain actors have accumulated significant years of experience in the tomato business and would have possessed the necessary expertise to adjust and adapt to any improved technologies when introduced.

Table 1. Socio-economic distribution of the respondents

Variables	Marketer		Consumer		Producer		Processor		Input Supplier	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Gender										
Male	54	30.0	90	50.0	135	75.0	126	70.0	108	60.0
Female	126	70.0	90	50.0	45	25.0	54	30.0	72	40.0



Age (years)										
≤30	36	20.0	51	28.3	27	15.0	27	15.0	18	10.0
31-40	60	33.3	46	25.6	36	20.0	36	20.0	45	25.0
41-50	50	27.8	43	23.9	81	45.0	72	40.0	72	40.0
>50	34	18.9	40	22.2	36	20.0	45	25.0	45	25.0
Mean		41		39		49		49		46
Marital status										
Single	27	15.0	72	40.0	36	20.0	45	25.0	45	25.0
Married	153	85.0	108	60.0	144	80.0	135	75.0	135	75.0
Household size										
≤ 5	99	55.0	72	40.0	81	45.0	45	25.0	81	45.0
6 – 10	81	45.0	90	50.0	81	45.0	72	40.0	81	45.0
>10	9	5.0	18	10.0	18	10.0	63	35.0	18	10.0
Mean		3		6		5		7		5
Educational status										
Primary education	36	20.0	54	30.0	18	10.0	27	15.0	9	5.0
Secondary	81	45.0	72	40.0	90	50.0	63	35.0	81	45.0
Education										
Tertiary education	63	35.0	54	30.0	72	40.0	90	50.0	90	50.0
Experience (years)										
<10	126	70.0	0	0	153	85.0	162	90.0	162	90.0
11-20	45	25.0	99	55.0	27	15.0	18	10.0	18	10.0
>20	9	5.0	81	45.0	0	0	0	0	0	0
Mean		9		19		8		8		7
Primary occupation										
Crop farming	18	10.0	27	15.0	99	55.0	81	45.0	45	25.0
Livestock farming	9	5.0	18	10.0	18	10.0	0	0	0	0
Trading	126	70.0	45	25.0	18	10.0	27	15.0	90	50.0
Civil servant	18	10.0	54	30.0	36	20.0	54	30.0	36	20.0
Artisan	9	5.0	36	20.0	9	5.0	18	10.	9	5.0
Access to credit										
Yes	63	35.0	-	-	72	40.0	36	20.0	126	70.0
No	117	65.0	-	-	108	60.0	144	80.0	54	30.0
Total	180	100	180	100	180	100	180	100	180	100

The results also indicated that the majority (70%) of the marketers were traders, while the consumers comprised a diverse group, including crop farmers, livestock farmers, traders, civil servants, and artisans. Among the producers, the majority (55%) were engaged in crop farming, while approximately 20% of them were civil servants who considered tomato farming as a secondary source of income. For the processors, around 45% considered crop farming as their primary occupation, while 30% were civil servants who engaged in tomato processing to supplement their income. As for the tomato input suppliers, 50% were traders, while 25% and 20% were crop farmers and civil servants, respectively. These findings indicate that tomato value chain actors still participate in other occupations to sustain their livelihoods in the area. However, despite the majority (70%) of the tomato input suppliers having access to credit for their businesses, only 35%, 40%, and 20% of the marketers, producers, and processors, respectively, had access to credit to finance their operations. This lack of access to credit poses a significant challenge to the expansion and productivity of the value chain actors' businesses.

**Costs and returns of the value chain actors**

The result in Table 2 indicated that with an estimated total cost (TC) of N314, 860.00 invested in tomato production, a producer will generate a total revenue (TR) of N485, 412.00 and a net profit of N170, 552.00 per production cycle. Also, a return on investment (ROI) of 0.54 will be realized, which implies that, for every N1 invested in the business, a producer will realize a return of 54 kobo. The input supplier had an estimated cost of N210, 854.00 and revenue of N408, 422.00 with a net income of N197, 568.00. The return on investment was 0.94, implying that for every N1 invested on tomato input supply, a return of 94 kobo will be realized. Similarly, for every N96, 058.00 invested on tomato marketing in the study area, a total revenue of N138, 648.00 will be realized with a net profit of N42, 563.00 and an ROI of 0.44. This implies that, for every N1 invested in tomato marketing, there is a return of 44 kobo. The result also revealed that with an invested total cost of N2, 076,628.00, a tomato processor will generate a revenue of N3, 086,000.00 and a net profit of N1, 009,372.00 with an ROI of 0.49, which means for every N1 invested in tomato processing, a return of 49 kobo is realized. The results of the costs and returns as indicated in Table 2 indicated that tomato business is profitable for all the value chain actors but the input suppliers made higher returns with an ROI of 0.94. This could probably be because most of the inputs are sold dried, storable and less perishable.

Table 2. Costs and returns of the value chain actors

Items	Producer (N)	Input supplier (N)	Marketer (N)	Processor (N)
Total variable cost	145,490	34,705	79,274.50	912,368
Total fixed cost	169,370	176,149	16,810.50	1,164,260
Total cost	314,860	210,854	96,085	2,076,628
Total revenue	485,412	408,422	138,648	3,086,000
Net profit	170,552	197,568	42,563	1,009,372
ROI	0.54	0.94	0.44	0.49

Factors affecting the income of the tomato producers (farmers)

Based on some econometric considerations such as several significant variables, the F – ratio and the R² value, the linear functional form was selected as the lead equation. As seen in the results in Table 3 below, gender, years of education and labour cost were significant in influencing the profitability of the tomato producers in the study area. The result further revealed that gender was statistically significant at 1% and had a positive influence on the farmer’s net profit. This implies that the probability of being a male farmer will increase the net profit by a 4.454 coefficient. Years of education were significant at 1% and had a



positive influence on the net profit. The result implies a year's increase in education of the farmers will increase their net profit by the coefficient of 2.27. Furthermore, labour cost had a negative influence on the producer's net profit and was significant at 5%, implying a naira increase in labour cost, will decrease the farmer's net profit by 0.315 coefficient.

Table 3. Factors affecting the net profit of the producers

Variables	Coefficient	Standard error	T-value	Significant
Constant	-23.767	28.553	-.832	0.425
Gender	4.454	1.406	3.167	0.010***
Marital status	4.108	14.221	0.289	0.779
Age of respondent	0.196	0.122	1.606	0.139
Household size	0.078	0.460	0.170	0.868
Years of education	2.728	0.737	3.704	0.004***
Experience	0.254	0.606	0.420	0.683
Membership of association	-1.041	1.225	-.850	0.415
Labour cost	-0.315	0.136	-2.309	0.044**
Farm size	-0.403	0.394	-1.023	0.330
Dependent variable: Net revenue				
R ² -squared: 0.796				
F-value: 4.32				
Note: *, ** and *** mean significant at 10%, 5% and 1% respectively.				

Factors affecting the income of the tomato processors

As indicated in Table 4, the value of R² was 0.922 which implies that 92.2% of the total variation in the level of net return was accounted for by all the explanatory variables in the regression model while the remaining 7.8% is explained by the random error. The significance of the F-Value of 13.0 (P < 0.05) implies that all the explanatory variables jointly exerted significant influence on the net return of tomato processors in the study area. The regression analysis revealed that the gender of the processor, marital status, household size, years of education and membership of association had significant contributions to the processor's net return while the age of the processor had a negative significant effect on the tomato processor's net profit in the study area. The result of gender showed that the chance of the processor being male will increase the net profit by the coefficient of 9487.8, marital status was significant at 5%, which implies that married tomato processors have the chance of increasing their net profit by 4071.9 coefficient. The processor's age was negatively significant at 1%, implying a year increase in the processor's age, will decrease the net profit by 557.7. Also, the coefficient of household size was significant at 1%. An increase in household size will increase processors' net profit by 1052.6 coefficient, while years of education were significant at 1% and had a positive influence on the net profit. The result implies a year increase in education will increase the net profit of the processors by the coefficient of 4559.4.



Table 4. Factors affecting the net profit of the processors

Variables	Coefficient	Standard error	T-value	Significant
Constant	60860.802	13377.155	4.550	0.001
Gender	9487.818	1974.477	4.805	0.001***
Marital status	4071.920	1331.362	3.058	0.012**
Age of the respondent	-557.736	145.585	-3.831	0.003***
Household size	1052.622	366.128	2.875	0.017**
Years of education	4559.449	1352.246	3.372	0.007***
Experience	-1083.072	582.760	-1.859	0.093
Membership of association	-6088.364	1957.036	-3.111	0.051
Labour cost	-725.996	783.382	-0.927	0.376
Cost of input	-0.011	0.016	-0.705	0.497
Dependent variable: Net revenue				
R-squared: 0.922				
F-value: 13.083				
Note: *, ** and *** mean significant at 10%, 5% and 1% respectively.				

Factors affecting the income of the tomato input supplier

In Table 5 below, the value of R^2 was 0.632 which implies that 63.2% of the total variation in the level of net return was accounted for by all the explanatory variables in the regression model while the remaining 36.8% is explained by the random error. The significance of the F-value of 4.2 ($P < 0.05$) implies that all the explanatory variables jointly exerted significant influence on the net return of tomato input suppliers in the study area. The regression analysis revealed that only years of education of the input supplier had a significant contribution to the input supplier's net return in the study area. The coefficient of years of education was significant at 5% and had a positive influence on the net return. The result implies that a year increase in input supplier years of education will increase the net return by the coefficient of 126664.9.

Table 5. Factors affecting the net profit of the input supplier

Variables	Coefficient	Standard Error	T-Value	Significant
Constant	-261594.109	412291.977	-0.634	0.543
Gender	10819.460	28700.098	0.377	0.716
Marital status	-33211.926	30681.203	-1.082	0.311
Age of the respondent	1616.428	2199.268	0.735	0.483
Household size	-2036.385	11684.904	-0.174	0.866
Years of education	126664.976	57822.986	2.191	0.040**
Experience	-22236.755	14035.305	-1.584	0.152
Membership of association	4789.560	10059.481	0.476	0.647
Labour cost	574.049	27317.756	0.021	0.984
Cost of input	0.304	1.202	0.253	0.807
Dependent variable: Net revenue				
R squared: 0.632				



F-value: 4.249

Note: *, ** and *** mean significant at 10%, 5% and 1% respectively.

Factors affecting income of the tomato marketers

In Table 6, the result showed the value of R² was 0.869 which implies that 86.9% of the total variation in the level of net return was accounted for by all the explanatory variables in the regression model while the remaining 23.1% is explained by the random error. The significance of the F-value of 5.95 (P < 0.05) implies that all the explanatory variables jointly exerted significant influence on the net return of tomato marketers in the study area. The regression analysis revealed that only the Cost of purchase of tomatoes had a significant contribution to the marketer’s net return in the study area. The coefficient of cost of purchase was significant at 1% and negatively influenced the net profit of the marketers. It was revealed that a naira increase in the cost of purchase will decrease the marketers’ net profit by 0.19 coefficient.

Table 6. Factors affecting the net profit of tomato marketers

Variables	Coefficient	Standard error	T-value	Sig.
Constant	4193.088	6349.401	0.660	0.526
Gender	-708.630	556.577	-1.273	0.235
Marital status	191.264	433.007	0.442	0.669
Age of the respondent	-40.746	57.529	-0.708	0.497
Household size	161.157	143.550	1.123	0.291
Years of education	-38.030	22.695	-1.676	0.128
Experience	9.897	32.988	0.300	0.771
Membership of association	-261.545	316.101	-0.827	0.429
Labour cost	0.021	0.032	0.637	0.540
Cost of input	0.495	0.401	1.234	0.248
Cost of purchase of raw tomatoes	-0.190	0.031	-6.075	0.000***
Dependent variable: Net revenue				
R-squared: 0.869				
F-value: 5.954				
Note: *, ** and *** mean significant at 10%, 5% and 1% respectively.				

Constraints faced by tomato producers

The result in Table 7 revealed the constraints faced by tomato producers in the study area. Price fluctuation, pests and diseases, inadequate capital, seed quality and viability and perishability/storage problems constituted the notable challenges facing the tomato producers in the study area.

Table 7. Distribution of tomato producers by constraints faced in the study area

Constraint	Not at all		Mild		Serious		Very Serious		Mean	Ranked
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
Price fluctuation	0	0	9	5	63	35	108	60	3.55	1 st
Pests and diseases	0	0	9	5	153	85	18	10	3.05	2 nd
Inadequate capital	18	10	45	25	63	35	54	30	2.85	3 rd



Seed quality & viability	0	0	63	35	99	55	18	10	2.75	4 th
Perishability/storage problem	18	10	72	40	36	20	54	30	2.7	5 th
Poor extension visits	18	10	54	30	72	40	36	20	2.7	6 th
High cost of transportation	36	20	36	20	63	35	45	25	2.65	7 th
High cost of irrigation	27	15	72	40	27	15	54	30	2.6	8 th
Lack of organized market	36	20	63	35	45	25	36	20	2.45	9 th
Weather variation	36	20	99	55	36	20	9	5	2.1	10 th

Constraints faced by tomato consumers

The result in Table 8 showed that the challenges of tomato consumers range from the high cost of tomatoes to the storage/perishability of fresh tomatoes in the area.

Table 8. Distribution of consumers by constraints faced in the study area

Constraint	Not at all		Mild		Serious		Very Serious		Mean	Ranked
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
High cost of tomatoes	0	0	0	0	45	25	135	75	3.75	1 st
Threats from adulterated processed tomatoes	0	0	9	5	36	20	135	75	3.7	2 nd
Inadequate income	0	0	0	0	99	55	81	45	3.45	3 rd
Storage/perishability of fresh tomatoes	99	55	27	15	27	15	27	15	1.9	4 th

Constraints faced by tomato input suppliers

The results further revealed in Table 9 that the high cost of materials was the most critical constraint faced by tomato input suppliers in the area. Inadequate capital to procure necessary input materials for sale constituted the second most critical problem while high cost of labour, lack of organized markets and high cost of transportation constituted the 3rd, 4th and 5th problems for the input suppliers in the study area.

Table 9. Distribution of input suppliers by constraint faced in the study area

Constraint	Not at all		Mild		Serious		Very Serious		Mean	Ranked
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
High cost of materials	0	0	27	15	99	55	54	30	3.15	1 st
Inadequate capital	9	5	27	15	90	50	54	30	3.05	2 nd
High cost of labour	0	0	72	40	108	60	0	0	2.6	3 rd
Lack of organized markets	18	10	99	55	36	20	27	15	2.4	4 th
High cost of transportation	63	35	54	30	54	30	9	5	2.05	5 th

Constraints faced by tomato marketers

As reflected in Table 10 below, inadequate capital, storage/perishability of fresh tomatoes, price fluctuations, threats from adulterated processed tomatoes, lack of organized markets and high cost of



transporting fresh tomatoes from the purchasing point to the selling point were the notable problems that affected the marketers in the study area.

Table 10. Distribution of marketers by constraints faced in the study area

Constraints	Not at all		Mild		Serious		Very Serious		Mean	Ranked
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
Inadequate capital	0	0	9	5	18	10	153	85	3.80	1 st
Storage/ perishability of fresh tomatoes	9	5	9	5	9	5	153	85	3.70	2 nd
Price fluctuations	9	5	18	10	0	0	153	85	3.65	3 rd
Threats from adulterated processed tomatoes	18	10	9	5	9	5	144	80	3.55	4 th
Lack of organized markets	9	5	18	10	27	15	125	70	3.50	5 th
High cost of transportation	18	10	18	10	18	10	125	70	3.40	6 th

Constraints faced by tomato processors

The results also indicated in Table 11 that the problem of the high cost of acquiring modern processing equipment, lack of organized markets and the problem of electricity supply constituted the 1st, 2nd, and 3rd most critical problems, while the high cost of labour, inadequate capital and price fluctuation of fresh tomatoes for processing were the 4th, 5th and 6th problems confronting tomato processors in the study area.

Table 11: Distribution of processors by constraints faced in the study area

Processor Constraint	Not at all		Mild		Serious		Very Serious		Mean	Ranked
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
High cost of modern processing equipment	0	0	0	0	135	75	45	25	3.25	1 st
Lack of organized markets	0	0	45	25	54	30	81	45	3.2	2 nd
Problem of electricity supply	0	0	36	20	108	60	36	20	3.0	3 rd
High cost of labour	0	0	18	10	153	85	9	5	2.95	4 th
Inadequate of capital	0	0	45	25	126	70	9	5	2.8	5 th
Price fluctuation of fresh tomatoes	18	10	135	75	27	15	0	0	2.05	6 th

Conclusion

The findings of this study concluded that all the actors made appreciable profits from the tomato value chain business, but tomato input suppliers made the highest profit in the area. Also, gender, marital status, household size, years of schooling and experience have positive correlations with the profitability of the actors, while the increase in age of the actors, labour cost and cost of purchasing tomatoes have a negative correlation with the profitability of the tomato value chain actors. Finally, price fluctuation, lack of capital, high cost of tomatoes, high transportation cost and the threat from adulterated processed tomatoes were the major constraints faced by the tomato value chain actors in the study area. It is therefore recommended that the Ministry of Agriculture and other stakeholders should provide sustainable education to tomato value chain actors on improved production, processing, marketing, and value-addition measures. Additionally,



credit facilities should be made accessible to enhance production, processing, and increase the appeal to consumers, while also improving the shelf life of tomatoes. The establishment of well-organized tomato markets and cooperative societies is advised to collectively address challenges and access various benefits, reducing dependency on government assistance.

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