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Input-output Market Information Access and Methods of Selling Maize and Tomato Products in Bako Tibe and Guto Gida Districts, Ethiopia

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Abstract: The study is to describe the marketing system of inputs and outputs; identify weather there is marketing system inefficiencies and integration in inputs and outputs of maize and tomato marketing system in Bako Tibe and Guto Gida districts. From the result, there is an information gap with and among producers, Development Agents, input suppliers, traders, and consumers. The majority of the producers preferred cooperatives to sell their products. According to producers' reported disease, low price of grain, poor market linkage, shortage of chemicals and unlicensed traders were the major challenges in both maize and tomato production. Shortage of inputs, farmers reluctant to buy inputs, high competition unlicensed traders, weak government support, and shortage of storage were the main challenges in input supply while low quality with poor awareness, low supply, unlicensed traders, brokers and demand fluctuations were also major challenges in traders. Enhancing the technical knowledge and skill of farmers, Development Agents, input suppliers, and buyers need the training to provide effective enabling service to increase market efficiency among the actors. Besides, build the capacity of farmer's cooperatives in value chains of inputs and outputs, considering market-oriented extension service and improving the enabling environment in promoting competition in agribusiness marketing efficiency.

Keywords: Input-output, Maize, Marketing Information, Selling and Tomato

1. Introduction

Maize is a staple food and strategic crop in Ethiopia particularly in the study areas. Over half of all Ethiopian farmers grow maize on average 0.8 ha of farming size, mostly for subsistence, with 75% of all maize produced being consumed by the farming household. It is believed that the consumption of maize has significantly increased over the years, as maize is the cheapest grain for farmers in food deficit rural areas and low-income households in the urban areas [1, 2]. Improving smallholders' tomato production would contribute to enhancing food security and alleviating poverty [3, 4]. Farmers in the study areas produce maize along with tomato mostly to support their livelihood and increase their income [5, 6].

Even though, both crops are contributed a vital role in farmers and others actors' livelihood and income sources in the areas, the crops are characterized by low production and productivity due to high price of inputs (fertilizers and seeds), limited modern agricultural technologies, poor and biased agricultural policies and lack of knowledge on limited resources while high volatility of crops prices even from week to week were fluctuated, lack of transportation and limited market information [7]. Farmers in these areas perceive that inputs and output marketing system in their areas are not efficient, especially the pricing mechanizes of inorganic fertilizer, maize improved varieties and grain of outputs [2].

A marketing system is a network of individuals, collection of actors, channels, intermediaries, business activities, and institutions which facilitate the physical distribution and economic exchange of goods [8]. It can also be regarded as a multi-layered sequence of physical activities and of transfers

of property rights from the farm-gate to the consumer. A channel of distribution of marketing system is path traced in the direct or indirect transfer of the title to a product as it moves from a producer to ultimate consumer.

Input and output marketing system efficiency play key roles in adoption of technologies and increasing production and productivity from improved agricultural technologies [9-11]. Market development was recommended for such marketing system insufficiencies to increases the competitiveness of selected agricultural sub-sectors that target national, sub-regional and international markets thereby contributing to agricultural growth [12, 13]. Before market development and other short and long term interventions are going to realized, areas of marketing system effectiveness and inefficiencies should have to be identified for both inputs and outputs marketing [14, 15]. If farmers do not have efficient input and output markets, they resist investing in new and more productive technologies.

Therefore, there is a need to understand what is wrong in marketing system of inputs and outputs marketing system of maize and tomato to discover some solution for such problems and to inform policy makers decisions with the following objectives: to describe the marketing system of inputs and outputs in the study areas; identify weather there is marketing inefficiencies and integration in inputs and outputs marketing system based on information and to assess constraints of maize and tomato producers, traders and input suppliers in the study areas.

2. Research Methodology

2.1. Description of the Study Areas

The study was conducted in Guto Gida and Bako Tibe districts of east Wollega and west Shewa zones, respectively. Both districts were selected purposively based on maize and tomato production potential and market access.

Bako Tibe is located in Western Oromia at about 251 km from Addis Ababa and 80 km East of Nekemte, the zonal capital East Wollega zone. Out of the total area of the 104,452 ha, crop land accounts for 37,906 ha and the remaining land is allocated for community land, forest and other purposes. Geographically, the study area is located 37^0 3' 27" E longitude and 09^0 07' 12" N latitude and categorized into three agro-ecology like as lowland (51%), midland (37%) and highland (12%). The annual rainfall of the study area ranges of 1200-1300 mm and has an annual temperature range of 13.8-27.8°C. The study area has total population 136,829 of which 47.1% are male and 52.9% are female.

Guto Gida district is located at about 328 kilometers distance from Finfinnee to the western direction possessing a total area of 901.80 km^2. The district is divided in to three distinct geographical areas with different proportion; namely, highland (0.26%), midland (46.74%) and lowland (53%).

2.2. Sampling Techniques

Sampling technique is an exact plan for obtaining a sample from a given population before data is collected [16]. A combination of both purposive and two stage of random sampling techniques were employed to draw appropriate sample households. In the first stage two districts Bako Tibe from west Shewa zone and Guto Gida from east Wollega zone districts were selected purposely based on maize and tomato production extent and suitable agro-ecology for crops. In the second stage, seven kebeles (four from Bako Tibe district and three from Guto Gida district) were selected purposely considering high potential of maize and tomato production. Finally, in every selected kebele, probability to proportional size sampling was also used to identify 161 households for surveyed.

Traders and input suppliers were selected based on numbers of traders and inputs suppliers in the areas. Accordingly, 26 traders (16 from maize traders and 10 tomato traders) were selected randomly based on probability proportionality to size while 13 inputs suppliers were selected purposively based on inputs they supplied.

2.3. Data Collection

Both primary and secondary data were employed for this study. Primary data were collected from maize and tomato producers, traders and input suppliers using a semi-structured questionnaire during 2018-2019 cropping season. Secondary data were collected by reviewing the required documents from inputs suppliers, government and non-government offices, traders credit sources in inputs and outputs marketing, which related to this study to support primary data results.

2.4. Methods of Data Analysis

The data was analyzed using descriptive statistics such as mean, standard deviation, percentage, frequency and ranking for a given survey information. Chi-square test for discrete variables and independent sample t-test for continuous variables were applied to identify variables that vary significantly between the study areas.

3. Results and Discussion

3.1. Sample Households Characteristics

A combination of different descriptive statistics was performed on the sample households' characteristics of both districts. The average age of sample household heads was 38.1 years. Age of household heads across the districts were significantly different at 10% probability level. The average household size across the surveyed was 6.5 with 6.7 Bako Tibe and 6.2 Guto Gida districts which is greater than national average family size which is 4.6 [17]. The majority of the household heads (80.1%) were found to have at least a year education level. The average education level of the sample household heads during survey period was about 6.4 years with 6.5 and 6.1 years in Bako Tibe and Guto Gida districts, respectively. The difference between the two

districts respect to family size and education level were insignificant (Table 1).

Table 1. *Descriptive statistics of sample household characteristics.*

Continuous variables	Bako Tibe (101)		Guto Gida (60)		Total (N=161)		t-value
	N	Mean	N	Mean	N	Mean	
Age of household head	101	36.2 (10.3)	60	41.3 (13.6)	161	38.1 (11.9)	2.7*
Family size	101	6.7 (2.5)	60	6.2 (2.3)	161	6.5 (2.4)	-1.1
Education level household	88	6.5 (2.8)	41	6.1 (2.7)	129	6.4 (2.8)	0.9
Maize experience	101	18.5 (10.1)	60	12.5 (8.5)	161	16.2 (9.9)	-3.8***
Tomato experience	98	4.7 (3.5)	57	5.0 (3.2)	155	4.8 (3.4)	0.5
Nearest market distance (min)	101	36.7 (22.5)	60	63.6 (55.6)	161	46.7 (40.3)	4.3***
FTC distance (min)	101	28.0 (20.5)	60	22.0 (14.6)	161	25.7 (18.7)	-2.0
Average land (ha)	98	1.5 (1.1)	59	2.6 (3.9)	157	1.9 (2.6)	2.5*
Average (TLU)	101	8.5 (5.3)	57	7.7 (8.4)	158	8.2 (6.6)	-0.7

***, **, and * indicate statistically significant at 1%, 5% and 10% probability levels, respectively and figure in the parenthesis are standard deviation.

The study also required to establish farmers' experiences in growing maize and tomato crops. The result show that farmers had the longer experience in growing maize with over 16.2 years and growing tomato 4.8 years. The maize growing was significantly different at 1% probability level where as tomato growing was insignificant (Table 1).

The sample households were on average walk a distance 25.7 minutes with 28 minutes at Bako Tibe and 22 minutes at Guto Gida districts to access extension services. Extension service is the more effective in encouraging fast adoption than subsidies [18]. The sample households on average walk a distance 46.7 minutes with 36.7 minutes at Bako Tibe and 63.6 minutes at Guto Gida districts to access nearest market center which was statistically significant at 1% probability level (Table 1).

The average land holding by sample households were 1.9 hectares with 1.5 and 2.6 hectares in Bako Tibe and Guto Gida districts, respectively. There is a significantly difference in land holding between districts at 10% probability level. Regarding to livestock holding about 8.2 Tropical Livestock Unit per households owned with 8.5 and 7.7 TLU in Bako Tibe and Guto Gida districts, respectively. On average land holding by surveyed households were 1.9 hectares with 1.5 and 2.6 hectares in Bako Tibe and Guto Gida districts, respectively (Table 1).

Economic transformation of rural livelihoods market improvement linkages along the value chain is critical which is increases opportunities and choices of rural farmers and reduces fluctuations between household consumption and income [12]. Efficient integrated access to information and other infrastructure help reduce transaction costs thus raising incomes of the rural poor [13, 19].

About 4.3% of the surveyed households were female headed with 5.9% in Bako Tibe and 1.7% in Guto Gida districts. Over 93.2% of sample households were married with 90.1% in Bako Tibe and 98,3% in Guto Gida districts. The marital status was significantly different at 10% probability level and the gender of households was insignificant (Table 2).

Table 2. *Marital status and gender category of sample households.*

Discrete variables		N	%	N	%	N	%	X^2
Marital status	Married	91	90.1	59	98.3	150	93.2	4.0*
	Single	10	9.9	1	1.7	11	6.8	
Household gender	Male	95	94.1	59	98.3	154	95.7	1.7
	Female	6	5.9	1	1.7	7	4.3	

3.2. Maize and Tomato Land Allocative Trends over the Last Three Years

The study looked at land tenure and how land under farmer's control was utilized in both commodities. The result show that an average of 1.43-1.62 hectares was allocated to maize during 2015/16-2017/18 cropping season by rain fed while limited farmers were applied irrigation for maize while 0.33-0.5 hectare was allocated to tomato by irrigation. This revealed that over the last three years the land allocated for both commodities were increased.

Farmers in Guto Gida district had better maize farm size (2.14-2.27 hectares) during the survey period where as 1.04-1.25 hectares of farm were operated in Bako Tibe district. In Bako Tibe limited number of farmers (5.94-6.93%) were produced tomato by rain fed while in Guto Gida no farmers produced tomato by rain fed (Table 3). This implies that majority of sample farmers were produced tomato by irrigation.

Table 3. *Maize and tomato area allocated over the last three years.*

Production seasons		Bako Tibe (N=101)				Guto Gida (N-60)				Total (N=161)			
		Maize (ha)		Tomato (ha)		Maize (ha)		Tomato (ha)		Maize (ha)		Tomato (ha)	
		% hhs	Mean	% hhs	Mean	% hhs	Mean	% hhs	Mean	% hhs	Mean	% hhs	Mean
2015/16	Rain fed	97.03	1.04	5.94	0.22	88.33	2.14			93.79	1.43	3.73	0.22
	Irrigated	4.95	0.28	50.50	0.32	21.67	0.27	61.67	0.27	11.18	0.27	54.66	0.30
2016/17	Rain fed	99.01	1.09	6.93	0.23	88.33	2.18			95.03	1.46	4.35	0.23
	Irrigated	8.91	0.51	62.38	0.39	28.33	0.36	80.00	0.24	16.15	0.41	68.94	0.33
2017/18	Rain fed	100	1.25	5.94	0.54	98.33	2.27			99.38	1.62	3.73	0.54
	Irrigated	7.92	0.40	82.18	0.47	23.33	0.48	55.00	0.64	13.66	0.45	72.05	0.52

3.3. Maize and Tomato Inputs Used over the Last Three Years

Adoption of improved varieties has effect of raising farm incomes as it allows multiplier effects to take root, raising the general welfare of the farmer [11]. The results of this analysis for the varieties grown during 2015/16-2017/18 cropping season were presented in table 3. Among the maize varieties both Bako hybrid (BH-660, BH-66 and BH-540) and pioneer (limu and shone) were widely grown in both districts. Over the last three years Bako hybrid varieties users were decreased while pioneer varieties users were increased. Tomato producers were widely used Galilea and cochoro varieties. Over the last three years Galilea variety users were increased and cochoro users were decreased due to high yielders, better color and size (Table 4).

Sample households obtain their inputs (seeds, fertilizers and chemicals) from farmers' union and private dealers. Farmers union/cooperative formed the highest source of fertilizers with about 85.3% and 80.1% of farmers were reported in Bako Tibe and Guto Gida districts, respectively while few of private and others* were supplied. This implies that inorganic fertilizers were monopolized by cooperative without clear price methodology, only distributed with one channel and price negotiating. As a result, these unclear supply systems implicate market inefficiency or market imperfection. Maize and tomato seed and chemicals were supplied by private dealers in both districts. About 69.1% and 75.8% of farmers were obtained maize seed from private suppliers in Bako Tibe and Guto Gida districts, respectively (Table 5).

According to the sample households reported the price of maize and tomato seed increased from time to time than other inputs due to input speculation and shortage of seed. This result implies that there is maize seed market inefficiency due to input speculation [19].

Table 4. *Input used and sources by sample households for the last three years.*

Production Seasons	Bako Tibe (N=101)										
	Maize seed (%)								Tomato seed (%)		
	N	BH-661[a]	BH-660[b]	BH-540[c]	BH ([a+b+c])	Limu[d]	Shone[e]	Pioneer ([d+e])	N	Galilea	Cochoro
2015/16	86	7.0	5.8	38.4	51.2	34.9	14.0	48.8	42	38.1	61.9
2016/17	89	6.7	3.4	20.2	30.3	51.7	18.0	69.7	58	62.1	37.9
2017/18	101	6.9	3.0	26.7	36.6	51.5	11.9	63.4	83	78.3	21.7

Guto Gida (N=60)							
Maize seed (%)					Tomato seed (%)		
N	BH-540	Limu[d]	Shone[e]	Pioneer ([d+e])	N	Galilea	Cochoro
53	41.5	9.4	49.1	58.5	25	20.0	80.0
56	33.9	12.5	53.6	66.1	22	27.3	72.7
60	35.0	3.3	61.7	65.0	33	27.3	72.7

Table 5. *Maize and tomato input sources of sample households during 2017/18 cropping season.*

Sources	Bako Tibe (N=101)								Guto Gida (N=60)							
	Maize (101)		Tomato (83)		Fertilizer (101)		Chemicals (101)		Maize (60)		Tomato (33)		Fertilizer (60)		Chemicals (60)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Own			15	18.1							5	15.2				
Private suppliers	70	69.3	60	72.3	4	3.9	70	69.3	18	30	25	75.8	8	13.3	44	73.3
Farmers union	15	14.9			86	85.2	20	19.8	19	31.7			48	80.0	13	21.7
Others*	16	15.8	8	9.6	11	10.9	11	10.9	23	38.3	3	9.0	4	6.7	3	5.0

Note: Others* are research centers, BoANR and NGOs for research purpose.

3.4. Institutional Services

Institutional services are services which institutions performs in the marketing process of any else product and add utility to the product [20]. These institutions were those who perform the activities necessary to transfer goods from the producer to consumer and inputs from its production areas to product producers, because of the benefit of specialization and scale that exist in marketing. In the study areas; service provider, institutions provide services like products production extension services, marketing information services, credit services and improved agricultural inputs supply services which presented in tables.

3.4.1. Agricultural Extension Service

Agricultural production extension service in Ethiopia is mainly given by public institutions for analyses different sources of information available and success rate of each in speeding up technology adoption [21]. This service is mainly provided in the country in generally and in the study areas in specific by the office of agriculture and natural resources through its development agents at kebele level. The government policy of Ethiopia on agricultural development has started to emphasize the transformation of subsistence agriculture into market orientation as a basis for long term development of the agricultural sector [22].

Table 6. *Extension and credit services of sample household.*

Description		Bako Tibe (N=101)				Guto Gida (N=60)				Total (N=161)			
		N	Maize	N	Tomato	N	Maize	N	Tomato	N	Maize	N	Tomato
Service received (%)		82	81.2	42	50.6	47	78.3	24	72.7	129	78.8	66	56.9
Contact frequency			4.1		3.4		3.3		2.7		3.8		3.2
Source (%)	DAs (%)	79	96.3	42	100	47	100	24	72.7	126	97.7	66	100
	NGOs (%)	14	17.1	9	21.4	2	4.3	3	9.1	16	12.4	12	18.2
	Research center	12	14.6	6	14.3	3	6.4	1	3.0	15	11.6	7	10.6
Information areas (%)	Production	80	97.6	42	100	46	97.9	23	69.7	126	97.7	65	98.5
	Post-harvest	46	56.1	22	52.4	27	57.4	9	27.3	73	56.6	31	47.0
	Marketing	22	26.8	12	28.6	22	46.8	6	18.2	44	34.1	18	27.3

The study from the two districts revealed that about 78.8% and 56.9% of sample households reported that they received on agricultural production management and post-harvest handling extension services on maize and tomato respectively from different resources (Table 6). Majority of respondents were received extension services from Development Agents mainly focused on crop production managements and post-harvesting methods. Limited number of respondents were received extension service on marketing system especially on production market oriented without quality, transport, upgrading, demand situation, price and standardization. This poor information service on market brings market imperfection or inefficiency [23, 24].

3.4.2. Credit Access

The analyzed credit needs of farmers to adopt high yield inputs (seed, fertilizers and chemicals) [25, 26]. Results presented in table 7 indicate that 86.3% and 69.8% of the farmers who accessed credit for maize and tomato production, respectively. About 41.7% and 12.3% of sample households were received credit for purchasing fertilizer and seed (84.5%), chemicals purchase (34.5%) and market utility (39.7%) for maize production and tomato producers were received credit only for purchase or rent water pump. The result indicates that there is a big gap between credit access and received among the sample households. Microfinance (Oromia credit and saving S. C) was the major credit source who provided credit to the farmers.

Table 7. *Purpose of credit service of sample households.*

Description		Bako Tibe (N=101)				Guto Gida (N=60)				Total (N=161)			
		N	Maize	N	Tomato	N	Maize	N	Tomato	N	Maize	N	Tomato
Access credit service		92	91.1	62	74.7	46	76.7	19	57.6	139	86.3	81	69.8
Received credit service		36	39.1	8	12.9	22	47.8	2	10.5	58	41.7	10	12.3
Purpose	Inputs* purchase	30	83.3			19	86.4			49	84.5		
	Chemicals	15	41.7			5	22.7			20	34.5		
	Marketing utility	16	44.4			7	31.8			23	39.7		
	Water pump rent			8	12.9			2	10.5			10	12.3

*is seed and inorganic fertilizer (NPS and Urea)

3.4.3. Market Aspects

Crop marketing forms an integral part of famer's production decisions needs [10]. Though most of the subsistence farmers are net buyers of crop produce like maize selling the produce is necessary for the fulfillment of short-term needs [27]. In this study, we characterized markets used by farmers to sell their produce, methods of selling production outputs, buyers with behaviors, price decision and market information of the commodities in the study areas.

Results in table A1 show that about 98.8% and 100% of maize and tomato producers were sold their products, respectively. This implies that majority of producers are supply their products to the market. Collectors (34%), cooperative (34.6%) and wholesalers (35.8%) were the major maize buyers take lion share and preferred by producers due to better price, had potential, available in the areas whereas wholesalers (64.7) and consumers (25%) were the main tomato buyers and wholesalers are preferred due to had potential to buy and available in the areas. From these results we analyzed there is lack of competition in tomato marketing, inadequate market facilities and poor policy formulation and implementation especially on tomato [28].

The results presented in table A2 shows that about 27.7% and 81% of respondents were reported there is a buyer's shortage in areas for both crops due to inaccessibility (road), lack of market information and demand situation. This implies that the farmers are sale oriented, accepted any price violation, presence of many unlicensed traders and risk takers for market failures. Besides, price of the product decides by buyers it lead maize and tomato producers to market imperfection/inefficiency information [28]. This market information is critical in reducing market imperfection with choices type of market to sell their products.

Results presented in appendix 3 shows that about 79.2% and 58.6% farmers were received market information only on sale orientation (what farmers sold) on maize from DAs (22.2%), farmers (74.6%) and traders (34.1%) and tomato from DAs (27.9%), farmers (64.7%) and traders (41.2%),

respectively. This sale orientation information with farmer's source indicates that farmers were failed to decides sale place, time, reduce marketing risks, limit market participation, lack demand driven or market oriented and lack of effective competition [28].

The results indicated that due to inadequate market information majority of producers were supplied their products to village and district markets. About 71.1% and 26.4% of respondents were supplied maize grain to village and district markets while about 44.8% and 36.2% of respondents were supplied tomato to village and district markets, respectively (Table A3). With these limitations of the market mechanism the producers failed to this market imperfection or inefficiency and inequality situation [28].

3.5. Constraints and Opportunities of Maize and Tomato Production Actors

Major maize and tomato production actors discussed in this study were inputs suppliers, producers and traders both inputs and outputs. These actors' constraints and opportunities or solution for the constraints were summarized the following.

3.5.1. Constraints and Opportunities of Producers

The key challenges that producers generally faced were summarized in table A4. Among these constraints were disease, low price of grain when compare to input prices, poor market linkage, shortage of chemicals and high present of unlicensed traders were the top five majors' constraints in maize and tomato producers in production and marketing system. These constraints indicated that input and output marketing information in the areas laid market inefficiency due to poor enabling environment like regulation on traders, market linkage system on grain price and inputs like chemicals and inadequate awareness of the technologies and marketing skills which contribute to low productivity and profitability which are consists with [29-31].

Availability of high yielding maize and tomato varieties with access, suitable agricultural development policies with good condition of production, better price of maize grain than previous (increase trend of maize grain from time to time) and better available of inputs than previous were the majors' opportunities which can help offset some of the challenges with appropriate policy measures for producers.

3.5.2. Constraints and Solutions of Input Dealers

The main constraints reported by both commodities inputs suppliers were summarized in table 8. Among these constraints shortage of inputs, farmers reluctant to buy inputs, high competition unlicensed traders, weak government support and shortage of storage were the top five majors' constraints reported by inputs suppliers.

Solutions were identified by sample households' inputs suppliers such as search alternative inputs sources, awareness on altitude of farmers for inputs used as recommended, awareness and regulation on unlicensed traders, access credit to solve capital shortage, government must give attention for inputs suppliers and establish inputs supply system were reported for the constraints identified.

Table 8. *Major constraints and solutions of sampled input dealers.*

Challenges	N	%	Rank	Solution
Shortage of inputs	13	100	1	Search alternative
Farmers reluctant to buy inputs	9	69.2	2	Awareness creation
Much competition with unlicensed traders	8	61.5	3	Regulation
Shortage of storage	6	46.2	5	Rent and construct
Shortage of capital	3	23.1	8	Access credit
Weak government support	7	54.8	4	Attention
Shortage of transportation	4	30.8	7	Facilitation and linkage
Poor infrastructure	5	38.5	6	Construct road

3.5.3. Constraints and Solutions of Traders

The key constraints of traders which presented in table A5 were summarized. Among these constraints low quality, demand fluctuation, high present of unlicensed traders, low supply and shortage in maize while supply fluctuation, high unlicensed traders, poor awareness on quality, brokers interference and demand fluctuation shortage in tomato were the top five majors' constraints marketing system.

Increase productivity using appropriate inputs to balance demand and supply situation, awareness creation on trade system and strengthens regulation on unlicensed traders and brokers, construct road to solve (transportation and price fluctuation), credit availability and time of repayment to solve shortage of capital and contractual agreement signed with awareness creation of contractual agreement were reported as solutions for the challenges identified.

4. Conclusions and Recommendations

Even though, maize and tomato were contributed a vital role to farmers and others actors in the study areas, the crops are characterized by low production and productivity due to different factors including inputs and outputs price fluctuating, lack of transportation and limited market information.

The result was described the information links and approaches of input supply and output marketing systems. From the sample household used maize Bako hybrid decrease from time to time due to information gaps among producers, DAs, Input suppliers, traders and others. Therefore, enhancing the technical knowledge and skill of farmers, DAs, suppliers and traders on maize hybrid and input and output marketing

efficiency system by providing training to provide effective enabling service to increase market efficiency among the actors.

Majority of the producers preferred union/coops to sell their products and better opportunities integrating inputs-outputs marketing system but the cooperative have poor capacity to serve farmers through the year so, build the capacity of farmer's cooperatives in value chains of inputs and outputs to improve farmers profit margin with available equal opportunities for all actors, technical backup (awareness on market system efficiency) and adequate credit facilities.

From the analysis we understand: the integration of input and output marketing system of producers, suppliers and traders relevant in enhancing agricultural production and productivity were poor. Hence, market-oriented extension services should be considered with improving enabling environment include market information (inputs &outputs), services access (credit and extension), rules and regulation (inputs &outputs) and others importance enabling by public and private sectors must play complementary roles in promoting competition in agribusiness across emerging marketing efficiency.

Disease, low price of grain, poor market linkage, shortage of chemicals and unlicensed traders are the major challenges in both maize and tomato production. Shortage of inputs, farmers reluctant to buy inputs, high competition unlicensed traders, weak government support and shortage of storage main challenges in input supply while low quality with poor awareness, low supply, unlicensed traders, brokers and demand fluctuations are also major challenges in trading systems. Thus, in order to exploit the benefits of the two commodities given the existing positive environment; private and public institutions in the supply of improved and supply of quality outputs more vital to improve input-output marketing system efficiency.

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Appendix

Table A1. *Characteristics of maize and tomato market aspects of sample households.*

Description		Bako Tibe (N=101)				Guto Gida (N=60)				Total (N=161)			
		N	Maize	N	Tomato	N	Maize	N	Tomato	N	Maize	N	Tomato
Farmers sale (%)		99	98	83	100	60	100	33	100	159	98.8	116	100
Methods of selling (%)	Direct to buyers	94	94.9	17	20.5	54	90	27	81.8	144	90.6	54	46.6
	Through broker	6	6.1	46	55.4	4	6.7	5	15.2	10	6.3	51	44.0
	Both	7	7.1	10	12.0			1	3.0	7	4.4	11	9.5
Buyers (%)	Collectors	37	37.4	11	13.3	17	28.3	6	18.2	54	34.0	17	14.7
	Cooperative	35	35.4			20	33.3			55	34.6		
	Wholesalers	38	38.4	52	62.7	19	31.7	23	69.7	57	35.8	75	64.7
	Retailers	8	8.1	7	8.4	6	10.0	14	42.4	14	8.8	21	18.1
	Consumers	7	7.1	10	12.0	5	8.3	19	57.6	12	7.5	29	25.0
Preferred (%)	Collectors	21	21.2			7	11.7			28	17.6		
	Cooperative	42	42.4			29	48.3			71	44.7		
	Wholesalers	21	21.2	59	71.1	14	23.3	21	63.6	35	22.0	80	69.0
	Retailers			2	2.4			11	33.3			13	11.2
	Consumers			5	6.0			5	15.2			10	8.6

Table A2. *Market accessibility and decision of sample households.*

Description		Bako Tibe (N=101)				Guto Gida (N=60)				Total (N=161)			
		N	Maize	N	Tomato	N	Maize	N	Tomato	N	Maize	N	Tomato
Difficulty to finding buyers		35	35.4	70	84.3	9	15	24	72.7	44	27.7	94	81
Reasons of buyers difficulty	Inaccessibility	6	17.1	34	48.6	3	33.3	15	62.5	9	20.5	49	52.1
	Shortage of information	11	31.4	47	67.1	4	44.4	10	41.7	15	34.1	57	60.6
	Demand and supply situation	13	37.1	29	41.4	7	77.8	7	29.2	20	45.5	36	38.3
Price decision	Sellers	11	11.1	9	10.8	5	8.3	7	21.2	16	10.1	16	13.8
	Buyers	88	88.9	74	89.2	52	86.7	17	51.5	140	88.1	91	78.4
	Supply and demand situation	13	13.1	6	7.2	6	10	11	33.3	19	11.9	17	14.7

Table A3. *Market information sources of sample households.*

Description		Bako Tibe (N=101)				Guto Gida (N=60)				Total (N=161)			
		N	Maize	N	Tomato	N	Maize	N	Tomato	N	Maize	N	Tomato
Received information (%)		87	87.9	53	63.9	39	65	13	39.4	126	79.2	68	58.6
Sources	DA (%)	16	18.4	15	28.3	12	30.8	4	30.8	28	22.2	19	27.9
	Farmers (%)	70	80.5	33	62.3	24	61.5	11	84.6	94	74.6	44	64.7
	Traders (%)	20	23	23	43.4	23	59	5	38.5	43	34.1	28	41.2

Description		Bako Tibe (N=101)				Guto Gida (N=60)				Total (N=161)			
		N	Maize	N	Tomato	N	Maize	N	Tomato	N	Maize	N	Tomato
Sale place	Village (%)	59	59.9	21	25.3	54	90	31	93.9	113	71.1	52	44.8
	District (%)	33	33.3	35	42.2	9	15	7	21.2	42	26.4	42	36.2
	Finfinnee city (%)	13	13.1	18	21.7	6	10			19	11.9	18	15.5

Table A4. *Major constraints and opportunities of sampled producers.*

Challenges	Maize (n=161)		Tomato (n=116)		Opportunities	Maize (n=161)		Tomato (n=116)	
	%	Rank	%	Rank		%	Rank	%	Rank
Unlicensed traders	53.4	5	72.5	5	Technology adoption	88.2	2	61.6	3
Disease	80.1	1	98.6	1					
Shortage of chemicals	56.5	4	78.0	3	Access new varieties	89.4	1	64.6	2
Poor extension service	36.6	8	61.9	6					
Poor market linkage	68.6	3	72.7	4	Better price of grain than previous	56.5	4	31.4	5
Poor infrastructure	47.2	6	45.7	10					
Shortage of credit	8.7	10	51.8	7	Better availability of inputs	47.2	5	43.9	4
Low price of grain	78.3	2	93.5	2					
Shortage of improved seed	34.2	9	51.1	8	Good condition for production	83.2	3	72.6	1
Lack of coordination	39.1	7	47.8	9					

Table A5. *Major constraints and solutions of sampled traders.*

Challenges	Maize (N=16)		Tomato (N=10)		Solutions
	%	Rank	%	Rank	
Low supply	81.3	4	50	8	Increase productivity using appropriate inputs
Price fluctuation	68.8	6	60	6	Awareness and price regulation
Low quality	100	1	40	9	Awareness creation and regulation
Poor Infrastructure	50	9	30	10	Construct road
Poor awareness on quality	56.3	8	90	2	Awareness creation
Shortage capital	75	5	60	6	Credit availability and time of repayment
High unlicensed traders	87.5	3	90	2	Regulation and awareness creation
Brokers interference	43.8	10	80	4	
Supply fluctuation	62.5	7	100	1	Contractual agreement and awareness
Demand fluctuation	93.8	2	70	5	

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