

Original Research Article

Value Chain Analysis of Bulla: The Case of Cheha and Mirab Azernet Districts

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Abstract: Bulla is an important staple enset product for most people living in the densely populated regions of South and Southwestern Ethiopia. However, only limited intervention has been done to improve the product even the consumption demand increases from time to time in different part of the country. This research attempted to analyze value chain of bulla in Cheha and Mirab Azernet districts, SNNPR Data for the study were collected from both primary and secondary data sources. The primary data were collected from 154 farmers, 35 traders and 28 consumers. The study result revealed that the production of bulla from enset were used more for consumption while the rest was marketed. In addition, interview and observation results also showed that the production of bulla declined because of enset disease that destroyed the crop, absences of institutional and technological enhancements were shared to existing inefficiencies in bulla production and utilization. Bulla value chain actors identified in the study include input suppliers, producers, local collectors, retailers, wholesalers, individual processors and consumers. Five market channels were identified for bulla marketing. The highest total gross marketing margins for bulla was 27.69% in channel V. The highest gross marketing margin of smallholder farmers in bulla market channels was 84.21% in channel II. The result of two stage double hurdle model revealed that, out of total 12 explanatory variables included in the model. Bulla market participation decision was significantly affected by quantity of bulla produced, enset production experience and market information. Quantity of bulla produced, education level, preferred quality of the product by buyers, marketing experiences, average bulla market price and extension service access significantly affected the volume of bulla sales. Policy recommendations drawn from the study results include improve the input access system, farmers knowledge and experience on bulla production and processing, solidification extension services, strength the linkage among bulla value chain actors, establish enset diseases controlling mechanisms, needs attention on bulla harvesting and processing technologies.

Keywords: Enset; Bulla; Value chain; Double-hurdle model; Cheha, Mirab Azernet.

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1. INTRODUCTION

Enset based farming system is an important staple crop for more than 20 million people living in the densely populated regions of South and Southwestern Ethiopia (Borrell *et al.*, 2019). The crop is being grown in many regions, however the dwellers of the central and southwestern parts of Ethiopia are the only people who usually used its products as a staple and co-staple food (Abebe, Wiersum and Bongers, 2010).

Enset is perceived to be relatively tolerant of drought, withstand heavy rain, tolerate flooding, and endure frost damage (Garedew *et al.*, 2017; Zerfu *et al.*, 2018). Enset can be harvested at any time during the year at any growth stage and the fermented enset products can be stored for long periods, basis of many households' food security (Sahle, Yeshitela and Saito, 2018; Brandt *et al.*, 2020). Enset is multipurpose crop used for food, fodder, fibers, traditional medicines, construction, ornamental purpose, fuel wood, containers, and as a provider of shade to intercropped

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annual or perennial crops (Olango *et al.*, 2014). The main food products obtained from enset plant are kocho, bulla and amicho (Chaka Tuffa, Kenea Amentae and Gebresenbet, 2017; Brandt *et al.*, 2020).

Enset products are core sources of food and income, its production is vital in Ethiopia. Yet, this vast potential of production has not fully exploited and promoted in the country. Weak marketing infrastructure, use of traditional technologies, limited supply, and poor marketing support services and market information contribute to under manipulation of enset production potential. Moreover, land shortage, persistent drought, disease, lack of improved varieties in terms of yield and disease resistance; labor shortage, lack of improved processing and storage technologies, improper or cultural agronomic practice, financial limitation and longtime maturity are the main challenge in enset production. Besides, weak collaboration among and between value chain actors, inefficient enset marketing characterized by high margins and poor marketing infrastructure and services is considered to be a main constraint enset product marketing (Yilma, 2001; Zone *et al.*, 2012; Chaka Tuffa, Kenea Amentae and Gebresenbet, 2017).

In the previous, most of interventions to develop Enset farm focused more on increasing production food contribution, gender analysis, bio-diversity and livelihood activity and with less attention to marketing system and value chain. Production, processing, marketing and consumption activities are not organized to generate competitiveness and efficiency, subjected to periodical variation where surplus supply at the harvest time is the main feature ('Determinants of status and extent of Market Participation among kocho Producers in Hadiya Zone ', 2016; Ashenafi, Berhanu and Rijalu, 2020).

Enset is importance in improving welfare of farmers through household income, food security, poverty reduction and promotion of nutritional status in the study areas. However, use of traditional technologies and weak linkages along the market chain were mentioned the major problems constraining the potential benefits from the crop farming, limited empirical research evidences on its production, marketing and development practice of the crop to address the existing challenges in the study areas. Enset products actors' role, share of benefit and marketing margins along the value chain were not distinguished. Likewise, factors affecting market participation decision and market supply were not identified in the study areas. Hence, this study was intended to investigate value chain analysis of enset products at Cheha and Mirab Azernet districts and achieved the following objectives: (a) to identify bulla value chain marketing channels, actors and to draw up value chain map in the study area; (b) to analyze respective marketing margins across market channels in the study

areas; (c) to identify factors affecting bulla market participation decision and market supply; (d) to identify major opportunities and constraints of bulla value chain in the areas.

2. RESEARCH METHODOLOGY

2.1. Description of the Study Area

This study was undertaken in Cheha and Mirab Azernet districts of Gurage and Siltie Zones, respectively, Southern Nations, Nationalities and Peoples Regional State, Ethiopia.

2.1.1. Cheha district

Cheha district is one of the districts in Gurage zone, SNNPR, Ethiopia. The capital of the district is Emdbir, which is located at 188 km south – west of Addis Ababa on the way to Wolkite to Hossana town. The geographical location of the district extends from 8° 00' 18.9" to 8° 15' 28.53" N and 37° 35' 46.48" to 38° 03' 59.59" E at an elevation ranging from 1,900 to 3,000 meters above sea level (masl). Cheha district is bordered on the south by Enemorina Eaner, on the west by the Oromia Region, on the north by the Wabe river which separates it from Abeshge and Kebena, on the east by Ezha, and on the southeast by Gumer and Geta districts. The district constitutes 39 rural kebeles. The average annual rainfall of the area is about 1268.04mm. The existence agriculture in Cheha district is primarily based on enset, teff, maize, wheat, sorghum, potato, faba bean, field pea crop types. Farmers of the district also widely produce enset for different purposes like for food in the form of kocho, bulla, and amicho, for medical purpose and for construction. The leaves of enset are also used for different purposes like fed for cattle, tie and cooking of bread.

Mirab Azernet district

Mirab Azernet district is one of the districts in Siltie zone, SNNPR, Ethiopia. The capital of the district is Lera located 250 km south-west of Addis Ababa. Mirab Azernet is bordered on the southwest by the Hadiya zone, on the northwest by the Gurage zone, and on the east by Misraq Azernet Berbere district. It has two different agro climatic conditions, Dega and Woina-dega and consisting 37% and 63%, respectively. The average annual rainfall ranges from 1200 mm. Crop production takes the lion's share of consumption and income generation of the households. Cereals crops widely produced in the area include barley, wheat, pulse crops like field pea and faba beans, tuber and root crops include enset, potato, cabbage are major crops grown in the district. Particularly enset is main crop type using by farmers for different purpose.

2.2. Research Design, Data Types, Sources and Sampling Procedures

2.2.1. Data types and sources

Both qualitative and quantitative data types were collected from primary and secondary data

sources. The primary data was collected directly from sampled households. Secondary data sources used for this study were journals, relevant text books, Cheha and Mirab Azernet district agricultural and marketing office reports.

2.2.2. Sampling procedure

For this particular study Cheha and Mirab Azernet districts were selected purposively based on the enset production potential and marketing practice. The sample for this study was drawn from all actors involved along bulla value chain such as producers, local collectors, wholesalers, retailers, processors and consumers. Then this study was applied multi-stage sampling procedure to identify the sample households for data collection from enset producer kebeles in districts. In first stage, cluster sampling technique was used based on enset production potentials of the kebeles. Each district was clustered in to two clusters such as high enset producer, medium enset producer kebeles. In second stage, out of enset producer kebeles in districts, four kebeles were selected by using simple

random sampling technique (two kebeles from medium enset producer kebeles and two kebeles from high enset producer kebeles). In last stage, the sample respondents were selected by using systematic random sampling technique in each kebele. Finally, a total of 154 sample households were selected from the two districts for the purpose of this study.

2.2.3. Sample size determination

This study was applied a simplified formula provided by (Yamane, 1967). Accordingly, the required sample size at 95% confidence level with degree of variability of 5% and level of precision equal to 8% are used to obtain a sample size required which represent a true population.

$$n = \frac{N}{1 + N(e^2)} \quad n = \frac{13,254}{1 + 13,254(0.08^2)} = 154$$

Where, n = sample size, N= population size (sampling frame) and e = level of precision considered 8%

Table-1: The distribution of sample households across sample kebeles

District	Sample kebeles	Number of enset growers	Sample households
Cheha	Dakona	500	42
	Moche	445	38
Mirab Azernet	Jaremo	465	40
	Kecha chumeta	398	34
	Total	1808	154

Source: District and kebele offices, 2020

The sites for the trader surveys were different market places in which a good sample of bulla traders existed. On the basis of flow of bulla, four markets (Emdbir, Lera, Bole and Wolkitie) were selected as, the major enset products marketing sites for this study. Due to absence of recorded list of population of traders a purposive sampling method was used to select wholesalers, rural collectors and retailers from specified markets. As a result, 35 kocho and bulla traders were selected for the purpose of this study. Furthermore, 1 processor and 28 consumers were interviewed.

2.3. Methods of Data Collection

Different methods of data collection tools were implemented to acquire primary data. Among the data collection tools key informant interview and focus group discussion with pre-defined social groups (elders, model farmers, women's, Das and experts) were conducted before formal survey to collect general information about the study area bulla production and marketing. A checklist was also used to guide the discussion conducted to generate data that cannot be collected from individual interviews. The required households' data were collected from selected sample households with the help of pre - tested structured questionnaires.

2.4. METHOD OF DATA ANALYSIS

Both descriptive and econometric data analysis methods were applied to analyze the data collected from smallholder respondents using structured questionnaire. The analysis was done through using SPSS version 25 and STATA 15.

2.4.1. Value chain analysis

Value chain analysis is the process of breaking a chain into its constituent parts in order to better understand its structure and functioning. To understand the characteristics of the chain actors of bulla and the relationships exists between them, including the identification of all actors in the chain; the flow of product via the chain; the work features and the destination; information was obtained by conducting interviews, focus group discussion and by collecting secondary data from various sources. The study has employed value chain analysis which is very effective in tracing product flows, showing the physical value adding stages, qualitative and quantitative flow of product along the chain with identified key actors, their relationships with other actors in the chain and measured distribution of their benefits. This could be captured through mapping the value chain.

2.4.2. Marketing margin

According to (Ghorbani, 2008), marketing margin is important directories in the evaluation of value chain performance. It is the difference in the price paid by consumers and that received by the producers. Marketing margins are also calculated at different points along the value chain and then compared with consumer price. Once the basic structure of a marketing channel is established, it is relatively easy to collect information on the price at which the product is bought and sold at each stage in the production process (Smith, 1992). Computing the total gross marketing margin (TGMM) is always related to the final price paid by the end buyer and is expressed as percentage (Mendoza, 1997).

$$TGMM = \frac{\text{Final consumers price} - \text{Producers price}}{\text{Final consumers price}} * 100$$

Where, TGMM is total gross marketing margin

$$GMM_p = \frac{\text{Final consumers price} - \text{Marketing gross margin}}{\text{Final consumers price}} * 100$$

Or

$$GMM_p = 1 - TGMM$$

Where, GMM_p is the producers share in final consumer price

$$GMM_t = \frac{\text{Selling price} - \text{Purchasing price}}{\text{Final consumers price}} * 100$$

Where, GMM_t is the traders share in final consumer price

$$NMM = \frac{\text{Marketing gross margin} - \text{marketing costs}}{\text{Final consumers price}} * 100$$

The net marketing margin (NMM) is the percentage of the final price earned by the intermediaries as their net income after their marketing costs are deducted.

2.4.3. Econometric model specification

A double hurdle model was used to identify the factors that determine smallholder farmers' decision to participate (or not) in the output markets and the quantity of their supplied to the market. The determinants of decision to market participation kocho and bulla were analyzed first and then the determinants of quantity of supplied to the market was followed. Double hurdle model (Cragg, 1971) involves two-step estimation procedure.

First stage: In the first stage, probit model (first hurdle estimation) was used to identify factors affecting decision to market participation. Probit model takes values 1 and 0 that were assigned to represent the

choice whether a farmer decides to participate kocho and bulla market or not.

$$Y_i^* = x_i \beta + e_i$$

$$Y_i = \begin{cases} 1 & \text{if } Y_i^* > 0 \\ 0 & \text{if } Y_i^* \leq 0 \end{cases}$$

Where Y_i^* is the probability of an individual farm household decision to participate in kocho and bulla marketing; β_i is the vector of parameters to be estimated; X_i is the vector of explanatory variables explaining the participation decision probability; e_i is the error term and the error terms are assumed to be independently $e_i \sim N(0, 1)$ (Newman, Henchion and Matthews, 2003).

Second stage

In the second stage, the truncated regression (second hurdle estimation) model was used to analyze factors determining the quantity of kocho and bulla supplied to the market. Truncated regression excludes part of sample observation based on the value of the dependent variable. That is, the truncated regression uses observations only from sample households whose quantity supplied to the market positive or greater than zero. The quantity of kocho and bulla supplied to the market is modeled as a regression truncated at zero:

$$Q_i^* = x_i \beta + \mu_i, \mu_i \sim N(0, \sigma^2)$$

$$Q_i = \begin{cases} Q_i^* & \text{if } Q_i^* > 0 \text{ or } Y_i = 1 \\ 0 & \text{otherwise} \end{cases}$$

Where Q_i is the intensification quantity of marketed which depends on latent variable Q_i^* being greater than zero and conditional to the decision to participate in kocho and bulla marketing Y_i . If both decisions are made by the individual producers independently, the error terms are assumed to be normally distributed as: $\sim N(0, \sigma^2)$ (Newman, Henchion and Matthews, 2003).

3. RESULTS AND DISCUSSION

3.1. Descriptive Statistics Results

3.1.1. Kocho and bulla market price trend

Regarding the trend of kocho and bulla market price during last five years, majority of sampled respondents responded that the market price trend of kocho and bulla increasing. That is important to reduced food insecurity and source of income in the study areas. As indicated in below table 2. Out of total respondents 52.7% of kocho and 69.1% of bulla producers responded that market price trend during last five years is increasing in the areas.

Table-2: Kocho and bulla market price trend in the last five years

Product type	Trends	Frequency	Percent
Kocho	Increasing	58	52.7
	Decreasing	38	34.5
	The same	14	12.7
Bulla	Increasing	76	69.1
	Decreasing	17	15.5
	The same	17	15.5

Source: Computed from own survey data, 2020

3.1.2. Enset production and marketing calendars

According to the below mentioned table 3, major planting time of enset crop in the study districts, 69 (46%) of farmers said that December, 60 (40%) of farmers responded January. Regarding to enset harvesting time 61 (40.67%) of farmers answered November, 54 (36%) of sampled farmers responded that December and 34 (22.67%) sampled farmers responded October. Concerning of the marketing time, the

majority of sampled farmers responded that on January 44 (45.36%), February 19 (19.59%) and December 17 (17.53%). Enset products price become high on July 25 (25.77%), Jun 22 (22.68%) and August 21 (21.65%). April 30(30.93%) and March 29(29.9%) were the time for enset products price become medium. Enset products price become low on January 34(35.05%) and December 22(22.68%).

Table-3: Enset production and marketing calendars

Main activities	Months											
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Planting time			21	69	60							
Harvesting time		34	61	54	1							
Marketing time			9	17	44	19	8					
Low price time		2	14	22	34	20	5					
Medium price time					3	24	29	30	11			
High price time	19								10	22	25	21

Source: Computed from own survey data, 2020

3.2. Value Chain Map of bulla in the Study Districts

Value chain mapping enables to picture the flow of the product from input supply to end consumer through various actors. It helps to identify the different actors involved in the value chain, activities performance and to understand their roles and linkages. Therefore, understanding of value chain for enset

products is paramount important to examine factor that affecting smallholder farmers to meet market requirement and demand conditions through improving competitive and efficiency. Main activities include in enset products mapping input supply, production, trading, processing and consumption.

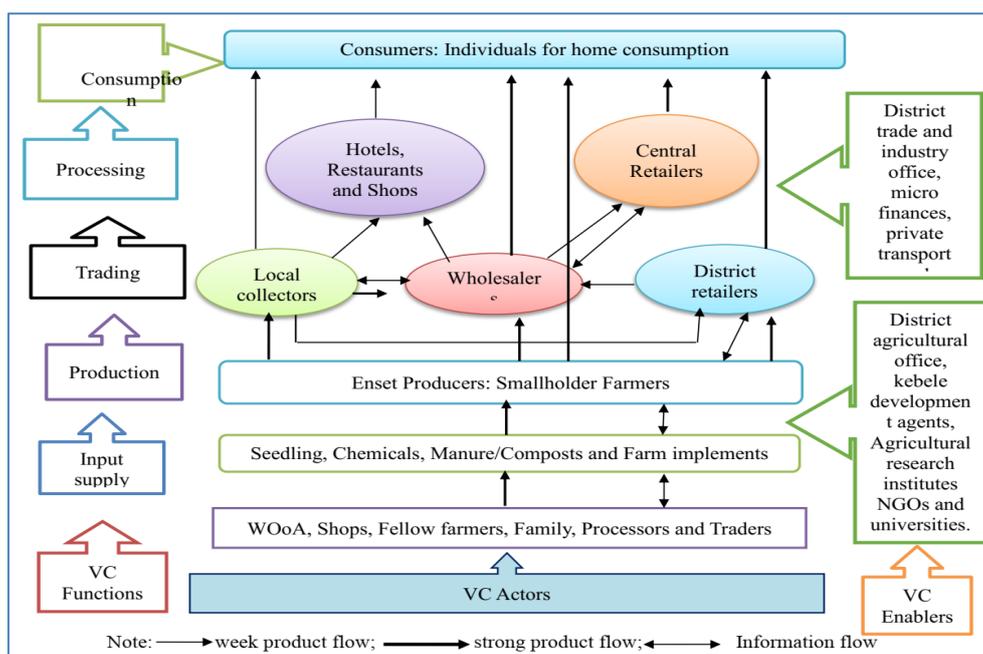


Fig-1: value chain map of bulla in the study districts

Enset input suppliers

Enset products value chain analysis starts at the input access level. Input supplies were not main activity in enset value chain. Inputs such as: animal manure, compost, variety, labor contribution, chemicals and farm implement which are supplied by district office of agriculture, research centers, neighbors, fellow farmers, other farmers and traders. From total sampled producers' largest proportion (93.3%) used local varieties while 6% both improved and local varieties and (0.7%) only used improved varieties of enset.

Enset producers

Producers perform most of the value chain functions starts from farm preparation on their farms to post harvest handling and marketing. The major value chain functions that enset producers perform include land preparation, growing, replanting, cutting, cleaning, storing, composting/manuring, and protecting from weed, pest/disease, harvesting and post-harvest handling and marketing.

Local collectors

Local collectors are independent part time traders at primary markets who collect enset products at local market and transport enset products from smallholder farmers to nearby by urban market centers. Local collectors also go to the farmer's field, negotiate price, purchasing, repacking, cleaning, sorting and ultimately transport mostly kocho and bulla products to urban markets using pack animals and small trucks. Their main sale outlets are relatively wholesalers, retailers and consumers.

Wholesalers

Wholesalers are traders involved in buying enset products from producer and local collectors in large volume than any actors and supplying them to retailers and consumer. Wholesalers have no license to do enset products marketing in the study district. Wholesalers' traders mostly purchase in large amount from the districts, transport and sell the products to the major towns like Hossana, Wolkitie, Adama, Butajira and Addis Ababa. Wholesalers have good storage, transportation and communication access than other actors.

Retailers

They are key traders in enset products value chain inside and outside the study districts. They are the final segment between producers and consumers. In the study districts there are two types of retailers, districts retailers and central retailers. District retailers are buying enset products either from farmers, local collectors' traders. While central (outside) retailers in major cities mostly they buy from wholesalers and sell to urban consumers. Mostly retailers buying enset products by considering color, texture, odor and moisture contain of the product. Consumers mostly buy

enset products from retailers as they offer according to their needs and purchasing power.

Processors

Processing of enset products in the sense of value addition is not as such practiced in the study districts. Processing function is undertaken by cafes, hotels or restaurants in which case cooked enset products are sold to consumers. kocho and bulla are commonly consumed in the form of cooked meals in different traditional dishes. On the other hand, individual processors buy enset products directly from local collectors, wholesalers and retailers specially bulla and kocho, upgrading product means filtering, change to powder form and packing by plastic means of increasing utility then sell to hotel, consumer and organizations.

Consumers

Consumers are final purchasers of enset products mostly from producers and retailers for consumption purpose. Enset product consumers are individual households (rural and urban dwellers), hotels and institutions.

Enablers and facilitator

Facilitators and enablers include all chain-based actors providing support services or representing the shared interest of the value chain actors. The supporting function players for enset products value chain are those who are not directly related to the enset products value chain but provide different supports to the value chain actors. Support service functions are essential for value chain development and include sector specific input and equipment providers, financial services, extension service, and market information access and dissemination, technology suppliers, advisory service, etc. In the study areas, there are some institutions supporting the enset products value chain in one way or another. The most common support providers are district office of agriculture, district trade and market development office, kebele development agents, micro finance institutions, private transporters, research centers, NGOs and universities.

3.3. Bulla Marketing Channels and Margins

3.3.1. Bulla marketing channels

Five major alternative channels were identified for bulla marketing in the study areas. These marketing channels are identified from the point of production until the product reaches the final consumer. Out of total 5,758 kilograms of bulla marketed by sampled farmers during survey year the highest (39.49%) was marketed through channel III and lowest (12.7%) was through channel IV. The survey results revealed that wholesalers and district retailers were the dominants receivers of bulla with percentage share of 39.49% and 33.26%, respectively.

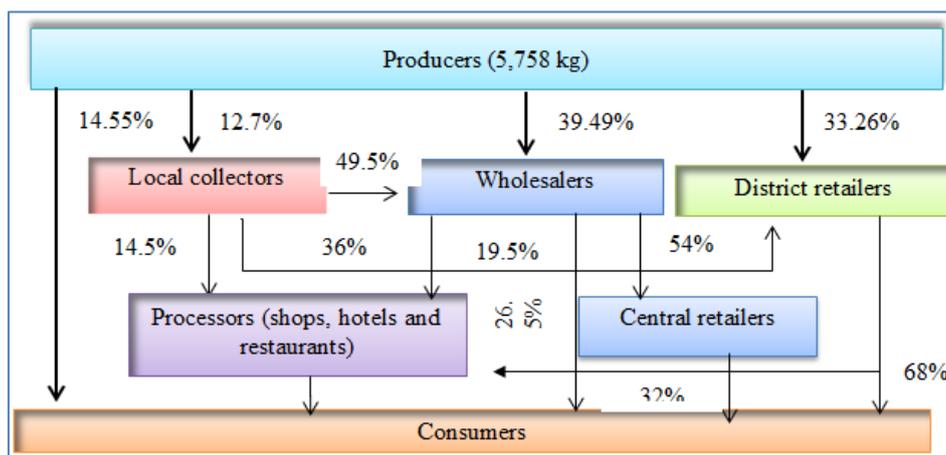


Fig-2: Bulla market channels

3.3.2. Bulla marketing margin analysis

The producers share (GMMp) was highest from the total consumers’ price in channel - II which was 84.21% and lowest in channel V which was 72.31%. The highest traders share (GMMt) from the total consumers’ price was taken by district retailers followed by wholesalers in channel – II and III which

accounts 15.79% and 15.38%, respectively. The lowest traders share from final consumers’ price was taken by local collectors in channel - IV which accounts 6.14%. The total gross marketing margin was maximum in channel - V which accounts 27.69% and the minimum in Channel II which accounts 15.79%.

Table-4: Bulla marketing margins (birr/kg)

Actors		Bulla marketing channels				
		I	II	III	IV	V
Producers	Purchased price					
	Production cost	5.86	5.86	5.86	5.86	5.86
	Marketing cost	1.05	1.05	1.05	1.05	1.05
	Selling price	26.5	24	25.5	23.5	23.5
	Profit margin	19.59	17.09	18.59	16.59	16.59
	GMP (%)	100	84.21	78.46	82.46	72.31
Local collectors	Purchased price				23.5	23.5
	Marketing cost				0.8	0.8
	Selling price				25.25	25.7
	Profit margin				0.95	1.4
	GMLC (%)				6.14	6.77
Retailers	Purchased price		24		25.25	
	marketing cost		1.85		1.85	
	Selling price		28.5		28.5	
	Profit margin		2.65		1.4	
	GMMR (%)		15.79		11.4	
Wholesalers	Purchased price			25.5		25.7
	Marketing cost			2.9		2.9
	Selling price			30.5		30.5
	Profit margin			2.1		1.9
	GMMW (%)			15.38		14.77
Central retailers	Purchased price			30.5		30.5
	Marketing cost			0.95		0.95
	Selling price			32.5		32.5
	Profit margin			1.05		1.05
	GMMCR (%)			6.15		6.15
TGMM (%)		0	15.79	21.54	17.54	27.69

Source: Computed from own survey data, 2020

3.4. Determinants of Bulla Market Participation Decision and Market Supply

Out of 150 total respondents interviewed and incorporated for analysis 59.3% were bulla market participants, while the rest 40.7% were bulla market non - participants. The result of 1st stage Double hurdle model estimation shows that the decision made by sampled households to marketed bulla or market participation decision is significantly and positively

influenced by quantity of bulla produced, enset production experiences and market information access.

The result of 2nd stage Double hurdle model estimation implies that a sample households' quantity of bulla marketed or volume supply to the market is positively and significantly affected by education status, quantity of bulla produced, bulla marketing experiences, extension access, preferred quality of the product and average bulla marketing price.

Table-5: Model result on determinants of bulla market participation and market supply

Bulla market participation decision					Volume sales of bulla (kg)		
Variables	Coef.	Std. Err	Z	dy/dx	Coef.	Std. Err.	Z
FAMs	-0.049	0.129	-0.38	-0.004	0.134	0.706	0.19
EDCs	0.094	0.119	0.79	0.008	1.174***	0.35	3.35
QBp	0.076	0.017	4.55	0.006***	0.382***	0.06	6.41
LHs	0.171	0.736	0.23	0.014	3.227	3.487	0.93
DNMc	0.008	0.018	0.43	0.001	0.039	0.104	0.38
EPExp	0.078	0.034	2.32	0.006**			
EXTa	-0.284	0.729	-0.39	-0.026	4.584*	2.611	1.76
MRKTinfo	1.523	0.761	2.00	0.146**	1.738	3.049	0.57
CRDTa	0.336	0.586	0.57	0.027	-0.319	2.53	-0.13
PREQbuy					6.561**	2.619	2.51
ABMprice					0.769**	0.319	2.41
MRKTexp					0.863***	0.295	2.93
_cons	-6.947***	2.221	-3.13		-20.949*	11.543	-1.81
/Sigma					11.20***	0.843	13.28
Number of obs = 150				Pseudo R2 = 0.8225		Number of obs = 89	
Wald chi2 (9) = 166.70				Prob > chi2 = 0.0000		Wald chi2 (11) = 341.60 Prob > chi2 = 0.0000	

Note: ***, ** and * show the values statistically significant at 1%, 5% and 10% level respectively.

Access to extension service (EXTa): It was positively and significantly associated with quantity of bulla sales at less than 10% significant level. The result shows that, if extension service increases by 1% from the current level, the quantity of bulla supplied to the market increases by 4.584 kilograms. The possible reason could be due to those who have access to the extension service and appropriately apply the techniques and advices suggested by the extension agents supplied more amounts to market than those who have no extension service access.

Education status (EDCs): It has positive effect on bulla quantity supply to the market with at 1% significance level. The result revealed that, if bulla producer gets more educated, the amount of bulla supplied to the market increases by 1.174 kilograms, by keeping other factors constant. The result further indicated that, education has improved the household capacity to acquire new idea in relation to market information and improved production, which in turn enhanced productivity and thereby increased marketable supply of bulla.

Enset production experience (EPExp): The expected influence of experience in the production of enset was positively taking the assumption that as

smallholder farmers becoming more experienced in enset production they could acquire skills and hence produce much and develop skills to participate in the bull market. This variable affects the probability of bulla market participation at 5% significant level. The model result shows that sample household enset production experience increases by one year the probability of bulla market participation decision increased by 0.6% by holding all other factors constant.

Quantity of bulla produced (QBp): The model result shows that bulla market participation decision and volume supplied to the market significantly and positively affected by quantity of bulla produced at 1% probability level. As quantity of bulla produced increased by one kilogram the probability of farmers' decision to market bulla increases by 0.6%. It also shows that the higher the bulla produced, the higher the farmer is willing to supply more bulla output to the market. The coefficient for quantity bulla produced by sample households implies that an increases quantity of bulla produced by one kilogram resulted an increase the volume supplied to the market by 0.382 kilogram, by keeping all other factors constant.

Average bulla market price (ABMprice): It has influence on quantity of bulla output supply to the

market positively and significantly at 5% significance level. If they perceive previous bulla market price as good, they decide to produce more and sales or supply more amount of bulla than those who do not perceived the previous market price as such. This confirms that output price is an inducement for farm household to supply more marketed surplus. The result shows that if average bulla market price increase by one birr the quantity of bulla marketed increases by 0.769 kilograms, by keeping other factors constant.

Enset products marketing experiences (MRKTexp): It has positive effect on bulla quantity supply to the market with at 1% significance level. The survey results revealed that, if bulla producer more experienced on enset products marketing or enset products marketing experience increase by one year, the amount of bulla supplied to the market increases by 0.863 kilograms, by keeping other factors constant. Enset products marketing experience enables them to have better skills, better access to market information and to create good linkage with bulla marketing actors to supply more bulla to market.

Access to market information (MRKTinfo): Access to market information was found to have a positive and significant influenced on farmers’ bulla market participation decision at 5% level of significance. This indicates that farmers those who have access to market information probably bulla market participation more than those who do not have access and better quantity of enset output sales. This is implying that farmer that had access to market information on price, buyers, production and marketing by different means of information like mobile, radio, traders, from other farmers and own observation would more quantity supplied and probability of bulla market

participation decision increased by 1.46% than those who had not access to market information. Result is in line with the findings (Seyoum, Lemma and Karippai, 2011), those who have access to market information probably potato level of participation in the market more than those who do not have access to market information.

Preferred quality of the products (PREQbuy): Bulla market supply significantly and positively affected by preferred quality of enset products by buyers at 5% level of significance. Those who produced quality of bulla product which is preferred by bulla buyers supplied to market more than others who do not produced quality bulla product. The result shows that, if enset producer produced preferred quality of bulla by buyers, the quantity of bulla supplied to the market increases by 6.561 kilograms, by keeping other factors constant.

3.5. Bulla Production and Marketing Constraints in the Study Districts

As it is showed in below table. Lack of harvesting technology (76.7%), lack of improved technology (62.7%), lack of technical training (58.7%), enset diseases (57.3%) and bad weather condition(frost) (56%) were the major production problems identified by sampled farmers in study districts and the remaining replied storage problems (46.7%), low yield (41.3%), lack of credit access (38.7%), high input costs (12%) and other problems (6%) were insignificant problems by sampled respondent farmers in the study districts. Major marketing constraints in the study districts were low market price of the products (65.5%), lack of demand (64.7%), poor actor’s linkage (63.9%), market access problem (57.1%), lack of market information (55.5%), and products price fluctuation.

Table-6: Bulla production and marketing constraints in the study areas

Production constraints	Frequency	Percent	Marketing constraints	Frequency	Percent
Lack of improved varieties	94	62.7	Low marketing price	78	65.5
Lack of harvesting technology	115	76.7	Shortage of supply	45	37.8
Enset diseases	86	57.3	Price fluctuation	64	53.8
Lack of technical training	88	58.7	Traders give same price	47	39.5
Lack of credit access	58	38.7	No market access	68	57.1
High input costs	18	12	Lack of market information	66	55.5
Low yield	62	41.3	Lack of demand	77	64.7
Bad weather condition (frost)	84	56	Poor actors’ linkage	76	63.9
Storage problems	70	46.7	High transportation cost	45	37.8
Other problems	9	6	Poor road access	37	31.1
			Shortage of truck	30	25.2

Source: Computed from own survey data, 2020

3.6. Bulla Value Chain Opportunities in the Study Districts

Adaptability and drought resistance of crop type (65%), Good weather conditions (62%), non – perishability of enset products (60%), social

coordination of community (work together) (45.3%), farmers’ indigenous skill and knowledge (41.3%) and conducive environment (40%) are major enset value chain opportunities in the study districts.

Table-7: Bulla value chain opportunities in the study areas

Kocho and bulla value chain opportunities	Frequency	Percent
Good weather conditions	93	62
Social coordination (work together)	68	45.3
farmers skill and knowledge	62	41.3
Adaptability and drought resistance of crop type	98	65.3
Non – perishability of enset products	90	60
Presence of infrastructure and market access	27	18
Other opportunities	26	17.3

Source: Computed from own survey data, 2020

4. CONCLUSION AND RECOMMENDATION

4.1. Conclusion

Out of 150 total sample households interviewed 59.3% were bulla market participants while 40.7% were non- market participants' households. The major actors involved in bulla value chain include input suppliers, producers, rural collectors, wholesalers, retailers, processors and consumers.

About five different market channels of bulla are also identified in the study areas. Producer's marketing profit share was highest (19.59 birr/kg) when they directly sell to consumers in channel I and to wholesalers in channel III which was about 18.59birr/kg and lowest when they directly sell to local collectors which was about 16.59 birr/kg in channel IV and V. Total gross marketing margin (TGMM) was highest in channel V which accounts, 27.69% and lowest in Channel II which was 15.79%. The producers share (GMMp) was highest (84.21%) from the total consumer's price in channel II and lowest (72.31%) in channel V. The highest trader share (GMMt) was taken by district retailers (15.79%) followed by wholesalers (15.38%) and lowest was taken by local collectors in channel IV which was 6.14%.

The result of double hurdle model revealed that, out of total 12 explanatory variables included in the model. Bulla market participation decision was significantly and positively affected by quantity of bulla produced, production experience and market information. Six variables were significantly and positively affected quantity of bulla sales education status, quantity of bulla produced, extension service access, preferred quality of the product by buyers, average bulla market price, market experience.

At farm level, the major production constraints are shortage of improved high yield varieties, lack of harvesting and processing technologies, enset diseases, lack of technical training, bad weather conditions like frost, low yield of the varieties, lack of credit access, lack of improved storage technologies, high cost of inputs, lack of availability of adequate pesticides/herbicides, harvesting and post- harvest handling activities and animal attacks. At marketing/trading stage, low market price of the products, lack of market demand, price fluctuation, market access problem, poor road and transport facility,

poor market information, product quality problem, poor actors' linkage as the major problems of enset products marketing. The major production and marketing opportunities of enset in the study areas are good weather conditions, adaptability and drought resistance of the crop, non-perishability of enset products, social coordination or working together of the community, indigenous skills and knowledge of the farmers.

4.2. Recommendations

Poor segment bulla producers with actors in the study areas. So, the district trade and industry office and any other concerned bodies should strength the linkage/interaction among value chain actors, there is a need to change the attitude of actors, by developing ground rules that will include the relationship between producers and traders.

In the study areas, farmers not took trainings about increasing production, marketing and diseases controlling system. On the contrary the demand of enset products within the country especially, in many large cities increasing. So, the farmers need intensive training how to develop their production, market linkage in line with facilitating marketing, enset diseases controlling mechanism and bulla value addition knowledge also important.

Bulla value adding activities in the study areas was poor. So, respective concerned bodies should capacitate enset producers and traders on processing and packaging enset products to improve income from the products.

No bulla harvesting and processing technologies in the areas. Farmers used traditional way of bulla harvesting and processing with high labor-intensive materials. So, the government should access enset harvesting and processing technologies to reduced farmers labour cost, to improve the quality of the products and to save working time.

Increasing production alone is not enough without getting a reasonable selling price and marketing linkage. The government should give price and market information and create market integration to enhance farmers' enset products marketing.

Finally, it is better to conduct further studies on other enset products value chain are recommended to identify best upgrading practices agreed by different chain actors in the study area and suggests processing industries to invest there. This will help smallholder producers to enhance their competitiveness.

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