



## Mango Value Chain Preliminary Analysis in Bahir Dar Town, Ethiopia

*Birara Endalew\**, *Berihun Tefera\*\**

Department of Agricultural Economics, College of Agriculture and Environmental Science, Bahir Dar University, Bahir Dar, Ethiopia, Fax: 251 (0582) 20 2025

**ABSTRACT:** The objective of the study was to undertake preliminary analysis of mango value chain specifically, to construct mango marketing channel, assessment of mango marketing margin and profit and the challenges of mango production and marketing. For this study both primary and secondary data were used from key informant interview, telephone interview, focus group discussion with producers and mango traders, and published documents.. Michael Porter value chain frame work followed by commodity approach was used to address the objective of the study. The result of the analysis confirms that there are four channels of mango marketing: producer – collectors – processor (agro-industries) – supermarket – consumers channel; producer – retailer - consumer channel; producer – wholesaler - processor (juice house, café & restaurant)- consumer channel and producer - consumer channel. To measure the performance of the channel, farmer-collector-wholesale- retailer-consumer channel was selected and analyzed. The result indicated that the marketing margin and profit share of the retailer was 37.5% and 34.2%, respectively. On the other hand, the average price of producers, retailers and consumers were 7.50 and 12 birr per kg. Short shelf life of the produce, price competition between actors, price fluctuation (due to seasonality of mango production) , temporary demand of consumers, lack of adequate processing systems, farmers not fully engaged in mango production (lack of mango based livelihood system), license requirement for retailers, shortage of input, disease, shortage of land, awareness of farmers about mango production (processing, management practice, means of income etc) and lack of market information are among the commonly cited constraints of mango production and marketing.

**Key words:** Challenges, mango, marketing, production, value chain

### 1. INTRODUCTION

#### 1.1 BACKGROUND AND JUSTIFICATION

Even though Ethiopia's agriculture is plagued by periodic drought, soil degradation, high population density, high levels of taxation and poor infrastructure, it is the foundation of the country's economy, accounting for 46.3% gross domestic product (GDP), 83.9% of exports, and 80% of total employment (Matous *et al*, 2013).

Ethiopia has a comparative advantage in a number of horticultural commodities due to its favorable climate, proximity to European and Middle Eastern markets and cheap labor. However, the production of horticultural crops is much less than the production of food grains in the country. On average, more than 2,399,566 tons of vegetables and fruits are produced by public and private commercial farms (less than 2% of the total crop production) (EIA, 2012).

More than 47 thousand hectares of land is under fruit crops in Ethiopia. Bananas contributed about 60.56% of the fruit crop area followed by Mangoes that contributed 12.61% of the area. Nearly 4.3 million quintals of fruits was produced in the country in 2005/2006. Bananas, Papayas, mangoes and oranges took up 49.4, 16.6, 12.8 and 11.8 percent of the fruit production, respectively (Fitsum *et al*, 2009). On the other hand, nearly 3.5 million quintals of fruits was produced in the country. Bananas, papaya, mangoes and

orange took up 55.32%, 12.53%, 12.78% and 8.35% of the fruit production, respectively (CSA, 2008).

Currently, mango is one of the most widely cultivated and traded fruit crops in the world, more than 85 countries have cultivated. Among those countries Ethiopia is one of them. In Ethiopia, mango is produced mainly in Oromia, Southern Nation and Nationalities People's Region, Benishangul and Amhara (Desta, 2005). From 12.61% of the area allocated for fruit production, mango took up 12.78% with annual consumption by the processing plant at full production capacity is 8.6 tones which is only 1.8% of the current production of mango (Elias, 2007). However, less than 2% of the produce is exported (Joosten, 2007).

Even though Ethiopia has large suitable land area for mango production, its production and productivity is low in the country. As different studies indicated, the export share of mango produce is low as compared to other agricultural export items.

Mango ranked 2<sup>nd</sup> and 3<sup>rd</sup> in total production and area coverage among fruit crops grown in Ethiopia, respectively. From 2003/4 to 2013/14, both its area coverage and total production increased by 208.4% and 247%, respectively. Despite this improvement in the last one decade, its productivity is very low, 7 tons/ha and Ethiopia produced only 72,187 tons fresh mango in 2013/14 (CSA, 2014).



Therefore, its potential has not yet been fully utilized and markets in different parts of the country are not sufficiently supplied with the demanded quantity and quality of mango (Yigzaw Dessalegn *et al*, 2014).

## 1.2 OBJECTIVES OF THE STUDY

The overall objective of the study is to undertake mango value chain preliminary analysis. Specifically aims to study:

- to construct mango marketing channel
- to determine mango marketing margin and profit
- to assess the challenges of mango production and marketing

## 2. RESEARCH METHODOLOGY

### 2.1 DESCRIPTION OF THE STUDY AREA

Bahir Dar is a city in north-western Ethiopia. It is the capital of the Amhara Region. Bahir Dar is one of the leading tourist destinations in Ethiopia, with a variety of attractions in the nearby Lake Tana and Blue Nile river. The city is known for its wide avenues lined with palm trees and a variety of colorful flowers.

Bahir Dar is situated on the southern shore of Lake Tana . The city is located approximately 578 km north-northwest of Addis Ababa, having a latitude and longitude of 11°36'N 37°23'E coordinates: 11°36'N 37°23'E and an elevation of about 1,800m above sea level.

Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), Bahir Dar has a total population of 221,991, of whom 108,456 are men and 113,535 women; 180,174 The three largest ethnic groups reported in Bahir Dar were the Amhara (96.23%), the Tigrayan (1.11%), and the Oromo (1.1%); all other ethnic groups made up 1.56% of the population. Amharic was spoken as a first language by 96.78%.on the other hand, 89.72% of the population said they practiced Ethiopian Orthodox Christianity, 8.47% were Muslim, and 1.62% were Protestants (Census, 2007).

### 2.2 SAMPLING TECHNIQUE AND SAMPLE SIZE

Purposive sampling technique was used for this study where in the first step Bahir Dar City is selected based on the interest area of the study. To address the objective of the study, the data were taken from, traders, ETFRUIT, cafe and restaurants, retailers and producers to generate first hand information about the selling and buying prices of mango produce from producer up to consumer and challenges of mango production and marketing in the study area.

### 2.3 TYPE, SOURCE AND METHOD OF DATA COLLECTION

Both primary and secondary data were used for this study. Key informant, focus group discussion and telephone interview were used to collect primary data. Finally, four retailers, two processors (juice house, café and restaurant) and one producer were interviewed to address the objective of the study. In addition to this, focus group discussions with input producers, traders and consumers were undertaken to support the result of quantitative data. On the other hand, the most important type of data for this study is secondary data that was collected through intensive reading of published documents related to the objective of the study such as analysis of mango marketing margin, profit and mango production and marketing constraints. The production, area harvested and yield of mango from 1998-2012 was obtained from FAOSTAT 2015 statistical table.

### 2.4 METHOD OF DATA ANALYSIS

After the required data were obtained from the respective sources, the next step is data analysis. So, Structure conduct and performance(S-C-P) frame work Michael Porter model was employed particularly to analyze the performance of mango marketing. To determine mango marketing margin (selling price – buying price) and profit (market margin-marketing cost), mango selling price, buying price and the associated marketing cost were collected. Market share analysis was employed to quantify shares of each actor along the channel. Descriptive statistics such as mean, standard deviation, minimum, maximum and tables were used to analyze and present the result obtained from both primary and secondary data.

## 3. RESULT AND DISCUSSION

### 3.1 Trends of mango production in Ethiopia

Even though the mango production varies from year to year, both the minimum and maximum production were recorded in 1998 (3500 tones) and 2012 (72753 tones) respectively; on the other hand, the average production was 40860.87 tones with standard deviation of 23908.87 tones. On the other hand, the maximum and minimum area harvested in hectare was 1000 ha (1998) and 8809 (2012) with mean and standard deviation of 5493.87 and 2397.44 ha, respectively. Similarly, the amount of yield in hg/ha were also reviewed from 1998-2012. So, the minimum and maximum amount of yield were obtained in 1998 (35000 hg/ha) and 2005 (101350 hg/ha) with mean and standard deviation of 67842.95 and 20421.06 hg/ha, respectively.

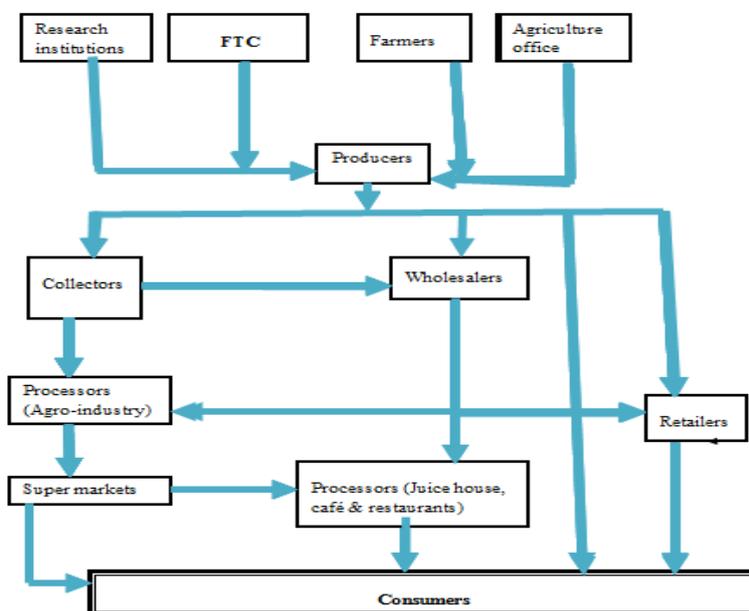
**Table 1:** Trends of mango production in Ethiopia (1998-2012)

Year	Area Harvest (ha)	Yield (hg/ha)	Production (tones)
1998	1000	35000	3500
1999	1700	38235.3	6500
2000	3300	45454.6	15000
2001	3642	54374	19803
2002	4000	62500	25000
2003	4964	58879.9	29228
2004	5814	51895.4	30172
2005	5400	101350	54729
2006	6796	92129.2	62611
2007	6731	71959.6	48436
2008	6051	72976.4	44158
2009	8630	76037.1	65620
2010	7513	87384.5	65652
2011	8058	90286.7	72753
2012	8809	79181.5	69751
Minimum	1000	35000	3500
Maximum	8809	101350	72753
Mean	5493.87	67842.95	40860.87
Standard deviation	2397.44	20421.06	23908.87

Source: FAO STAT, 2015

### 3.2 MANGO MARKETING CHANNEL

Marketing channel shows the linkage of marketing actors in the value chain process. For this study, it refers the connection of input suppliers (farmer’s training center, agriculture office, research institutions and farmers who sale mango seedlings) up to consumers of mango produce. The construction (mapping) of mango value chain provides information for marketing actors and other stakeholders to identify the major route of the flow of the produce from their origin to final destinations to design value chain intervention strategies. As a result, this study identified the channels of mango productions based on the information



The result of the interview revealed that mango marketing has different routes which are depicted in the figure below. The figure indicated that mango value chain has four channels. These are:

1. Producer – collectors – processor (agro-industries) – supermarket – consumers channel
2. Producer – retailer - consumer channel
3. Producer – wholesaler - processor (juice house, café & restaurant) consumer channel
4. Producer -consumer channel

### 3.3 MANGO MARKETING MARGIN AND PROFIT

Market performance can be evaluated by analyzing the costs and margins of marketing agents in different channels. A commonly used measure of system performance is the marketing margin or price spread. Margin or spread can be a useful descriptive statistics if it used to show how the consumer’s food price is divided among participants at different levels of marketing system (Getachew, 2002). On the other hand, marketing profit is the difference between price spread (margin) and marketing cost of the channel.

**Table 2:** Mango marketing margin and profit

	Price (Birr/kg)	Share (%)
<b>Producers</b>		
Selling price	7.5	62.5
<b>Retailer</b>		
Buying price	7.5	62.5
Selling price	12	100
Marketing cost	0.4	3.3
Margin	4.5	37.5
profit	4.1	34.2
<b>Consumers</b>	12	100

Source: owns survey, 2016

Marketing cost refers to those costs which are incurred to perform various marketing activities in the transportation of goods from producer to consumers. Marketing costs includes handling cost (packing and unpacking), costs of searching for a partner with whom to exchange, screening potential trading partners to ascertain their trustworthiness, bargaining with potential trading partners (officials) to reach an agreement, transferring the product, monitoring the agreement to see that its conditions are fulfilled, and enforcing the exchange agreement (Holloway and Ehui, 2002).

**Table 3:** Mango marketing margin and profit

	Price (Birr/qt)	Share (%)
<b>Farmer</b>		
Selling price	85	24.3
<b>Collector</b>		
Buying price	85	24.3
Selling price	175	50
Marketing cost	46	13.1
Margin	90	25.7
profit	44	12.6
<b>Wholesaler</b>		
Buying price	175	50
Selling price	250	71.4



Marketing cost	53	15.1
Margin	75	21.4
profit	22	6.3
<b>Retailers</b>		
Buying price	250	71.4
Selling price	350	100
Marketing cost	32	9.1
Margin	100	28.6
profit	68	19.4
<b>Consumers</b>	350	100

Source: Ayelech, 2010

Finally, this study determines the marketing margin and profit of selected channels based on the availability of the data obtained from the interview (juice house, café and restaurant, retailers and producers). Producer - retailer – consumer channel was selected to measure their performance in terms of marketing margin, profit and share. The result indicated that the marketing margin and profit share of the retailer was 37.5% and 34.2%, respectively. On the other hand, the average price of producers, retailers and consumers were 7.50 and 12 birr per kg (table 2).

In addition to primary data analysis, this study also analyzed and interpreted the data obtained from previous studies regarding to the subject matter. Finally, Farmers - collectors – wholesaler – retailer – consumer channel was selected to measure their performance in terms of marketing margin, profit and share. The result indicated that the marketing margin share of the collector, wholesaler and retailer were 25.7%, 15.1% and 28.6%, respectively. On the other hand, the marketing profits of the same actors were 12.6%, 21.4% and 19.4%, respectively. This revealed that higher marketing margin (retailer = 28.6%) is not a guarantee for higher profit (retailer =19.4). From the analysis, the wholesalers show better performance based on marketing profit as compared to the other actors along the channel.

### 3.4 CHALLENGES OF MANGO PRODUCTION AND MARKETING

Different constraints of mango production and marketing were identified based on the data obtained from key informant interview. So, the following factors are the bottle necks of mango production and marketing. These are: Short shelf life of mango produce, price competition between actors, price fluctuation (due to seasonality of mango production) , temporary demand of consumers, lack of adequate processing systems, farmers not fully engaged in mango production (lack of mango based livelihood system),

license requirement for retailers, shortage of input, disease, shortage of land, awareness of farmers about mango production (processing, management practice, means of income etc) and lack of market information.

Supplementary to primary data, the study also reviewed different literatures related to mango production and constraints. The result confirms that lack of organization like a farmer organization or cooperative amongst mango growers, highly seasonal nature of the mango crop, and also the tendency to prioritize food security with grain crops, mango growing is not the main livelihood activity for most farmers, and is generally considered a complementary activity to other farming practices were major constraints of mango production (James *et al*, 2008).

Similarly, different studies identified different constraints for mango production and marketing. According to Timoteos (2009), the major constraints of mango production include: lack of knowledge, skills and facilities in production, harvesting and post harvest handling, limited mango varieties, and limited capacity in research and development and extension services marketable mango varieties introduction and prevalence of mango fruit diseases and pests.

On the other hand, researchers identified the constraints of mango production in different ways. For instance, the study conducted by Haider and Demisse (1999), the production, marketing and consumption of mango fruits are restricted due to improper handling, inadequate transport and storage facility, disease problems, and sensitivity to low storage temperature. Growing and marketing of fresh fruits are complicated by post harvest losses both in terms of quality and quantity between harvest and consumption. The quality of fresh fruit depends up on the harvesting activities, post harvest handling, transportation and storage.

The findings of Alazar (2007) summarized the following major constraints of mango marketing



- ✓ Lack of markets to absorb the production
- ✓ Low price for the products,
- ✓ Large number of middlemen in the marketing system,
- ✓ Lack of marketing Institutions safeguarding farmers' interest and rights over their marketable produces
- ✓ Lack of coordination among producers to increase their bargaining power
- ✓ Poor product handling and packaging
- ✓ Imperfect pricing system
- ✓ Lack of transparency in market information system mainly in the export market
- ✓ Prevailing informal transaction in the export system

#### 4. CONCLUSION

Currently, mango is one of the most widely cultivated and traded fruit crops in the world, more than 85 countries have cultivated. Among those countries Ethiopia is one of them. In Ethiopia, mango is produced mainly in Oromia, Southern Nation and Nationalities People's Region, Benishangul and Amhara.

Ethiopia has a comparative advantage in a number of horticultural commodities due to its favorable climate, proximity to European and Middle Eastern markets and cheap labor. However, the production of horticultural crops is much less than the production of food grains in the country.

Even though Ethiopia has large suitable land area for mango production, its production and productivity is low in the country. As different studies indicated, the export share of mango produce is low as compared to other agricultural export items. So, research and development activities are essential to fill the gaps to enhance mango sub sector.

Short shelf life of mango produce, price competition between actors, price fluctuation (due to seasonality of mango production), temporary demand of consumers, lack of adequate processing systems, farmers not fully engaged in mango production (lack of mango based livelihood system), license requirement for retailers, shortage of input, disease, shortage of land, awareness of farmers about mango production (processing, management practice, means of income etc) and lack of market information are the major constraints of mango production and marketing. So, appropriate intervention mechanism should be designed to promote mango sub sector.

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