

Coffee Market Chain Analysis in Manna District Jimma Zone, South Western Oromia, Ethiopia

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ABSTRACT

This study was aimed at analyzing the coffee market chain in Mana district, Jimma Zone, Oromia region, South Western Ethiopia. The study was a cross sectional study. Both primary and secondary data sources were used. Mana district and two coffee cooperative associations were selected purposively based on their coffee production potentials. A total of 123 coffee producers, cooperative members, were selected randomly as the subject of the study. Interview schedule was used to collect the primary data. Both descriptive statistics and linear regression were used to analyze the data. The study revealed that the major actors in the coffee market chain in the study area are coffee producers, coffee producers' cooperatives, local coffee collectors, wholesalers, coffee producers' union, and exporters. It was found that the coffee producers earn more gross profit when they sell to cooperative than when they sell to the local collectors and wholesalers. The ordinary least square analysis with $R^2 = 0.878$ pointed out that land allotted for coffee production, selling price, experience in coffee production and access to market information were found to have a significant impact on the supply of coffee to the market. The study also pointed out that, the major constraints facing the coffee producers were shortage of finance and lack of price choice for the producers, lack of timely market information and inconsistent market price, respectively. Finally, improving the constraints would enhance the cooperatives' members' benefits.

Keywords: Coffee market chain, Cooperatives, Gross profit, Wholesalers

INTRODUCTION

In Ethiopia, an annual coffee production is 500,000-700,000 tones and an average national productivity is 7 quintal per hectare (CSA, 2018). The coffee industry is the driving force of the economy, ecology, socio-cultural and spiritual life of people. Nationally it is estimated that about 5,270,777 households are participated in coffee production activities (CSA, 2018). According to the Ethiopian Coffee and Tea Authority, (2018), coffee accounts for the lion's share of Ethiopian export earnings and plays an important role in the economy and livelihoods of Ethiopia's rural population. An estimated over 25 million people are engaged at least on coffee production, distribution, trading, processing, exporting and other support and downstream activities and also accounts for 25-30 percent of Ethiopia's total export earnings and 5 percent of GDP are derived from coffee exports.

In Ethiopia, Coffee is produced under four broad production systems, i.e. forest coffee (8-10%), semi forest coffee (30-35%), cottage or garden coffee (50-57%) and modern coffee plantation (5%) (UNDP, 2012). Even though coffee has economic and social importance for the Ethiopian economy, the market operation on the coffee sector has remained unsatisfactory especially for

smallholder coffee growers. This is because there is no significant change in the form of production and processing for several decades (Mintwn *et. al.*, 2014). Coffee production is vital to the Ethiopian economy with about one-fourth of the country's population directly or indirectly deriving their livelihoods from it (Abu, 2015). Coffee is a strategic commodity to Ethiopia that covers 24-26% of the total income of its earning and it is a source of income to a quarter of the population (Teddy, 2015). According to the study conducted by (Samuel *et. al.*, 2017) on average, coffee wholesaler retained significant annual total net benefit than producers and coffee collectors. Some case studies were undertaken regarding coffee value chain as well as its marketing in Ethiopia so far by different authors. For instance, Shumeta, *et.al.* (2012) conducted a study on market chains of forest coffee in Gera and Shebe districts of Jimma Zone, southwest Ethiopia; Alemayehu, (2015), conducted a study on the existing forest coffee market channel of Essara Woreda of Dawuro Zone Ethiopia. Solomon *et al.*, (2016) conducted a study on factors affecting farmers' coffee market outlet preference in Jimma zone Ethiopia. Dessalegn and Solomon (2014) conducted a study on analysis of coffee marketing cost and margins in South West, Ethiopia, exclusive of the current study area. In

all of the above studies, the points of attention were only on coffee market chain of forest coffee, producers' coffee market outlet choice, and couldn't comprehend cooperatives and their problems in this regard. For instance, they fail to consider cooperatives as major actors of the coffee marketing chain, didn't analyze the profit share of coffee producers when supplying their coffee through cooperatives', local collectors' and whole sellers' chain and in identifying determinants of producers' coffee market supply, there consideration was partial. Besides, there is lack of evidence regarding the coffee market chain in such a comprehensive manner and area specific. Therefore, this study was aimed at identifying the coffee producers' profit share and determinants of coffee market supply in the coffee market chain in the current study area, Haro and Doyo Bikila coffee producers' cooperatives of Mana district, Jimma Zone, Oromia regional state.

MATERIALS AND METHODS

Description of the Study Area

The study was conducted in Manna district, Jimma zone, Oromia regional state, southwestern Ethiopia. Manna district is one of the major coffee producing districts in Jimma zone, which is located at 368 km southwest of Addis Ababa and 20 km to the west of Jimma town. The total area of the district is 478.98 km²(47,898 ha) of which 12% is highland, 65% intermediate highland and 23% lowland with altitudinal ranges between 1470-2610 m.a.s.l (District Agriculture & Rural Development Office, 2018). The mean minimum and maximum temperatures are 13 degree Celsius and 24.8 degree Celsius, respectively (ARDO, 2018). The average annual rainfall is 1523 mm. Distric Nitosols and Orthic Acrisols are the dominant soil types with slightly acidic PH, which is suitable for coffee production in Manna district (ARDO, 2018). Mana is administratively divided in to 24 peasant associations, one urban kebele, and has 8 coffee producers' cooperatives. These cooperatives were the target for the current study.

Data Type and Sources

Data was collected from both primary and secondary sources. Primary sources of data were; the small holder coffee producers (cooperative members), and the cooperatives' leaders. Secondary data sources used were documents from coffee producer cooperatives, Mana District Office of Cooperatives Development.

Sampling Procedures and Sample Size

Mana district and the two cooperatives (Haro and Doyo Biqila) were selected purposively based on their coffee production potential and easily accessibility. The sample producers were selected randomly. According

to the office of Mana District Cooperatives Development, the population of the two cooperatives' coffee producers' households was 2017 in 2011 E.C. (2017/18). Accordingly, the sample size for the two coffee producers' cooperatives was calculated using the following Kothari, (2004), formula.

$$n = \frac{z^2pqN}{e^2(N - 1) + z^2pq}$$

where: n is the sample size for a finite population; N: size of population of coffee producers' cooperative members; p: frequency estimated for a sample of size n, where p is 0.5 and p + q= 1; e: margin of error considered is 9% for this study; Z α /2: normal reduced variable at 0.05 level of significance z is 1.96.

$$n = \frac{1.96^2 \times 0.5 \times 0.5 \times 2017}{0.09^2 (2017 - 1) + 1.96^2 \times 0.5 \times 0.5} = 113$$

Accordingly, the sample size for the two cooperatives is 113 coffee producers. In addition to the producers, 10 cooperatives' leaders (administrative committee members) were interviewed to cross check the response from the sample producers. Therefore, the total sample size (n) for this study is 123 household heads. Sample sizes for the two cooperatives were calculated using the following Kothari, (2004), population proportion formula.

$$n(\text{eachcoop}) = \frac{N(\text{coop}) \times n(\text{twocoop})}{N(\text{twocoop})}$$

where: n(coop): is the sample size at cooperative level; N(Coop): is the household number of a cooperative (coffee producers' population for each cooperative); n (two coops): is the sample size of the two cooperatives; N(two coops): is the total household number (population) of the two cooperatives.

According to the Office of Cooperative Development of Mana district, (2017/18), the number of the two coffee producers' cooperatives members are 2017, i.e. 953 and 1064 household heads for Haro and Doyo Bikila, respectively. Accordingly, the sample size for each of the two cooperatives was calculated below.

$$n(\text{Harocoop}) = \frac{953 \times 113}{2017} = 53$$

$$n(\text{DoyoBikila}) = \frac{1064 \times 113}{2017} = 60$$

Methods of Data Collection

Semi structured interview schedule was used to collect data, both from sample coffee producers, and cooperatives' leaders.

Methods of Data Analysis

In this study, descriptive statistical analysis and linear regressions were used to analyze the data collected. The detail justification of each of them is listed as follow.

Descriptive statistics such as frequencies and percentages were applied to describe the socio-demographic characteristics of the sample coffee producers. For identifying determinants of sample producers' coffee market supply in the study area, multiple linear regression models were used. The sample of small holder coffee producers were both members and none members of the cooperatives, who participated in coffee marketing during 2017/18 production year.

Model Specification: The model expresses the value of a dependent variable (market supply of coffee) as a linear function of more than one independent variables and an error term: which is specified as; $Y_i = \beta_i X_i + U_i$, where, Y_i = quantity of coffee supplied, β = a vector of estimated coefficient of the explanatory variables, X = a vector of explanatory variables, U_i = disturbance term.

Hypothesized explanatory variables represented by "X" are described as follows.

X_1 = Education level of household, X_2 = Price incentive, X_3 = Access to timely market information, X_4 = Access to credit, X_5 = Cost of Transportation, X_6 = Experience in Production, X_7 = Land size allotted to coffee production, X_8 = distance to the nearest market.

Explanation of the independent variables

- i. Educational Status of the Household: It is continuous variable measured in number of grades. Formal education enhances the information acquisition and adjustment abilities of the farmer, thereby improving the quality of decision making (Fakoya *et al.*, 2007). This variable is assumed to have a positive and significant impact on the supply of coffee to the market.
- ii. Selling Current Price: this variable is assumed to have a positive and significant impact on the supply of coffee to the market.
- iii. Access to Timely Market Information: This variable is a dummy variable, taking the value of 1, if a farmer gets coffee market information and 0, if otherwise. It is assumed to have a positive and significant impact on the amount of supply of coffee to the market, when the information obtained is about good market price and otherwise not.
- iv. Access to credit: This is a dummy variable taking the value of 1, if a farmer takes loan for production and marketing activities related to coffee and 0, if otherwise. In the current study, it is hypothesized to positively influence coffee market supply.

- v. Cost of Transportation: This cost is cost related to sell of coffee which is measured in single trip to the market in Ethiopian Birr. This variable is hypothesized to have a negative and significant impact on the supply of coffee to the market.
- vi. Experience in Production: This is a continuous independent variable measured in the number of years a household has been engaged in coffee farming. Households who have been in coffee production for many years are expected to have rich experiences regarding opportunities and challenges of coffee production and marketing. Therefore, this variable is assumed to have a positive and significant impact on the amount of supply of coffee to the market.
- vii. Land size allotted to coffee: This variable is measured in hectares. Farmer with large coffee land is expected to produce more coffee and he/she prefer to sell this coffee to the cooperative or formal market. Thus, total coffee land size is expected to have positive effect on cooperatives and formal market as compared to informal markets which is also true for total land holding.
- viii. Distance to the nearest market: This variable is measured in kilo meter. It was hypothesized that, as distance to the market increases, the supply of coffee to the market decreases; or, as distance to the nearest market decreases, coffee marketed supply increases.

RESULTS AND DISCUSSION

Socio-demographic Characteristic of Sample Coffee Producers

The overall profile of the sample respondents with regard to their socio-demographic situation is presented in table 1. According to the result shown in table 1 above, majority of the respondents (82.4%) were under the age group of 31 to 60. Regarding gender, it was found that majority (91.2%) of the sample coffee producers were male. There was also an indication that 61% and 56% of the sample respondents have completed their grade 9 to 10 and 5 to 8, respectively. Religion wise, the result shows that 96% of the sample coffee producers are Muslims.

Major Actors in the Coffee Market Channel and Channel Choice by Cooperative Members

Kohls and Uhl (2008) define marketing channels as "alternative routes of product flows from producers to consumers". Whereas marketing channels connect the marketers to the target buyers, the *market chain* describes a longer channel stretching from raw materials to components to final products that are carried to final buyers (Kotler, 2000). For the purpose of this study, both definitions are appropriate.

Table 1. Socio-demographic Characteristic of Sample coffee producers

Age	Freq.	%	Sex	Freq.	%	Religion	Freq.	%	Education	Freq.	%
20-30	1	0.8	Female	9	7.2	Muslim	118	96	grade 1-4	3	2.8
31-40	11	8.8	Male	114	91.2	Orthod.	2	1.6	grade 5-8	61	48.7
41-50	51	40.8	Total	123	100	Protest.	1	.8	grade 9-10	56	45.7
51-60	52	41.6				Wakefata	2	1.6	grade 11-12	3	2.8
61-70	8	6.4				Total	123	100	Total	123	100
Total	123	100									

Source: survey result 2017/18

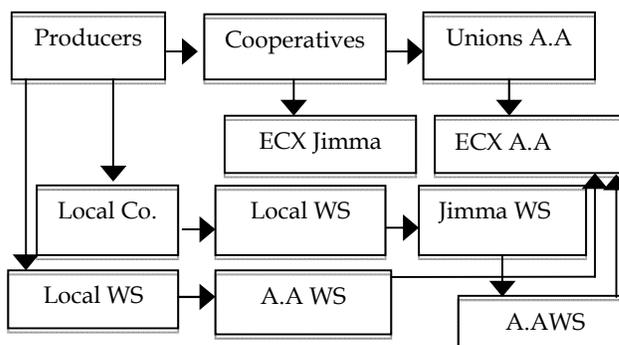


Figure.1. coffee market channel in Mana district: Source: Own survey, 2017/18. Note: A.A- Addis Ababa, Co. - Collectors, ECX- Ethiopian commodity exchange, WS- Wholesalers

Major Actors in the Coffee Market Channel

The study revealed that there were four channels in coffee market chain. The following figure1, shows the major actors in the coffee market channel. Producers market: The coffee producers produce and supply their coffee to the market. After the coffee is grown and matured, the major activities done by the producers in the chain include, harvesting red coffee cherry and transporting to cooperatives and/or to local collectors. This finding is in line with (USAID, 2010).

Local coffee collectors: The local coffee collectors directly buy the coffee from producers with its pulp and sale it to wholesalers for further processing activities and preparation for marketing. This finding is supported by the prior studies by (Samuel *et al.*, 2017); Shumeta, et.al. (2012).

Cooperatives market: The cooperatives market buys coffee cherry from producers, process it and majorly supply to coffee unions and sometimes to Ethiopian commodity exchange in Jimma.

Local wholesalers’ market: The local wholesalers in coffee supply chain buy coffee from local collectors and sell it to wholesalers in Jimma or in Addis Ababa.

Ethiopian Commodity Exchange (ECX) market: The Ethiopian commodity exchange buy processed coffee from either wholesale traders and/or the cooperatives’ union and export it to abroad.

Table 2. Coffee market channel choice by Cooperative members Mana District 2017/18

Channel choice	N	No. of Coop. members	%
Cooperatives	123	99	81
Local wholesalers	123	18	15
Local collectors	123	6	4

Coffee market channel choice by Cooperative members: Cooperative members coffee producers’ coffee market channel choice is given in table 2. As can be seen from the table 2 above, the study revealed that 81% of the coffee producers in the study area sold their red cherry coffee to their cooperatives, while 15% and 4% of the coffee producers sold their red cherry coffee to local wholesalers and local collectors respectively.

Producers’ Profit when Supplying to Cooperatives, Local Wholesalers and Local Collectors

The gross profit generated per kilogram of red coffee cherry when the producers sell to cooperatives, local wholesalers and local collectors is presented in table 3.

Table 3. Coffee producers 'gross profit when supplying red cherry coffee to Cooperatives, Local Wholesalers and Local collectors

Item	S Coop.	SLWS	SLC
1. Av SPPkg coffee berr	10.79	9.73	9.64
2. Pr. cpk coffee berr	6.00	6.00	6.00
3. M.cpk coffee berr	0.37	0.37	0.37
4. Gross margin berr	4.42	3.93	3.27

Source: Own survey, 2017/18. Note: Av SPPkg= Average price per kilogram, Pr.cpk =production cost per kilogram, M.cpk= Marketing cost per kilogram, Scoop= sells to cooperatives, SLWS= sells to local wholesalers, SLC= sells to local collectors

As can be seen from the table 3 above, the coffee producers earn more price when they sell to cooperative (berr 10.79 per a kilogram of red cherry, than the price of local wholesalers (berr 9.73per kg) and local collectors (berr 9.64 per kilogram of red cherry) and earn berr 4.42 per kg of coffee when they sell to cooperatives, berr 3.93 when they sell to local wholesalers and berr 3.27 per kg of coffee when they sell to local collectors. According to the interview with the cooperatives' leaders, the coffee producers sell their coffee to local wholesalers and to local collectors when the coffee producers' cooperatives are not ready to buy, that is, when the cooperatives could not obtain finance from the coffee producers union in time.

Determinants of Coffee Marketed Supply

Eight explanatory variables were hypothesized to determine the market supply by sampled coffee producer farmers. These include selling price of coffee, distance to the nearest market, transportation cost, access to timely market information, land allotted for coffee production, training on coffee production, experience of the respondents in coffee production and access to credit. The OLS result of the determinants of marketed supply of coffee is presented in table 4.

Selling price of coffee: This variable was found to have a positive and significant influence on the supply of coffee. According to the OLS estimates in table 4 below, when there is a one unit increases in price, the supply of coffee to the market increases by 0.135. This finding dovetailed with the result of the study done by Shumeta, et.al. (2012), and Mohammed (2013).

Access to timely market information: According to the OLS estimates in table 4 above, when there is a one unit increases in timely market information, the supply of coffee to the market decreases by 0.101kg. The inverse relation between access to market information and amount supplied can be attributed to the fact that as producers are getting information about the low market price before going to the market, they may refrain to bring their product to the market and prefer to store so as to sell it when the price become higher. This finding is in line with Shumeta, et.al. (2012).

Land allotted for coffee production: This variable was also found to have a positive and significant influence on the supply of coffee that, as the size of land allotted for coffee production increases by one hectare, the quantity of coffee supply to the market increases by 0.785kg. This finding is supported by prior study of Alemayehu, (2015) and Solomon et. al. (2016).

Table 4. Determinants of coffee marketed supply

Variable	Beta coeff.	t ratio	Sig.
Selling price p/kg coffee berr	0.135	2.930	0.004
Distance to the market in KM	-0.031	0.835	0.405
Transportation cost per quintal	0.024	0.647	0.519
Access to market information	-0.101	-2.863	0.004
Land allotted for coffee prod.	0.785	17.237	000
Training on coffee production	0.034	1.018	0.311
Experience of the respondents	0.066	2.478	0.002
Access to credit	0.029	0.771	0.442
R-square			0.878
Adjusted R square			0.869
n			123

Source: Own calculation, 2017/18

Experience of the respondents in coffee production: This variable was found to be significance influencing factors for the supply of coffee to the market. The regression in table 4 above indicates that, as an experience in production increases by one year, the quantity of supply of coffee increases by 0.066kg. The positive relation between experience in production and quantity supplied of coffee comes as a result of the fact that as producers get more experience with the production, they obtain a great skill and knowledge on how to increase production and supply of products to the market to increase their income. Similar result was found with the studies by Alemayehu, (2015); Solomon et. al. (2016) and Shumeta, et.al. (2012).

Major Constraints of the coffee producers' cooperatives in the Study Area

The major constraints of the coffee producers in Mana district include, lack of timely market information, inconsistent market price, and lack of price choice. These are presented in table 5. Lack of price choice: The majority (98.3%) of the sampled producers pointed out that they have no price choice in marketing their coffee. Both the cooperatives and the local coffee collectors buy coffee from the producers by the fixed price and producers only sale without any price choice. The

producers also pointed out that they are urged to sale their coffee to local collectors when their cooperatives are in short of finance, except selling for the price the traders offers them; they don't have no bargaining power.

Table 5. the major constraints of producers in the coffee market chain in the study area

No	Constraints	N	No. of respond.	%
1	Lack market information	123	111	90.2
2	Inconsistent price	123	109	88.6
3	No price choice	123	121	98.3

Source: own survey, 2017/18

Lack of timely market information: It was revealed that 90% of the sampled coffee producers didn't get market information when their coffee is ready for sale. The sampled producers also pointed out that, the market information transmitted from Addis Ababa via radio was helped them in providing market price information, but this time the message via radio and television is not clear. This finding is in line with the results of the prior studies by Dessalegn and Solomon (2014); Samuel, *et al.* (2017) and Solomon *et. al.* (2016).
Inconsistent market price:The sampled coffee producers also mentioned that they sale their coffee for a given price and after a day or two days, the market price changes and those who sold their coffee may lose the advantage of increased price. This finding is similar to the finding of Shumeta, *et.al.* (2012).

CONCLUSION AND RECOMMENDATION

Conclusion

Based on the above discussion the following conclusions were drawn. The objective of the study was analyzing the coffee market chain. It was revealed that the major actors in the coffee market chain in the study area were coffee producers, coffee producers' cooperatives, local coffee collectors, whole sellers, coffee producers' union, and exporters. It can be concluded that, the coffee producers earn more gross profit when they sale to cooperative rather than to the local coffee collectors. The coffee producers sale their coffee to local collectors when their cooperatives are not ready to buy due to lack of capital. From this, it can be concluded that the coffee producers' union sometimes fails to provide the amount of capital the cooperatives need to buy coffee from the producers. The ordinary least square analysis pointed out that land allotted for coffee production, selling price, and experience in coffee production are significantly and positively determine the supply of coffee to the market; while access to market information is significantly and negatively determine the supply of coffee to the market. The study also pointed out that, lack of price choice for

the producers, lack of timely market information and inconsistent market price were the major constraint facing the producers in coffee market chain.

Recommendation

On the basis of the findings of the study, the following interventions are necessary to improve the producers' benefits in coffee market chain in the study area.

In order to overcome the problem of lack of price choice, it is better that, the coffee producers' union provide cash to the cooperatives to enable them to purchase from the producers when they are ready to sale; so that, the producers sale their coffee for a price of their preference.

To improve the lack of timely market information, it is better the cooperatives' Development Office of Mana district disseminate market information through the widely used local media, that is, FM radios, repeatedly at the beginning of coffee marketing period.

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