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Determinants of Coffee Market Outlet Choice by Smallholder Farmers in Seka Chokorsa District, Jimma Zone, Ethiopia

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Abstract: This article is intended to identify coffee market outlets, analyze marketing margins and the determinants of outlet choice by smallholder farmers in seka chokorsa district of jimma zone. Both types and sources of data were used and collected from 124 coffee producers, suppliers, cooperatives and collectors to obtain necessary data and analyzed using multinomial logit model. The survey revealed that 41.1% of smallholders sold their sundried coffee to suppliers, 33.1% reported to have sold to cooperatives and about 25.8% of them sold their coffee to collectors. Analysis of marketing margins showed that the costs incurred by producers are very high almost more than half of the overall costs relative to costs incurred by primary outlets and they obtain fewer margins only about 28 percent which is not fair and seasonable compared to costs. Hence, there is a need to intervene in this gap to increase producers' share in the area through supplying inputs at low price which in turn reduces production costs. The results of multinomial logit model indicated that the probability of choosing cooperatives marketing outlet was affected by coffee farming experience, educational level of the household head and postharvest value addition compared to suppliers' outlet. Similarly, the probability to choose the collector outlet is found to be significantly affected by the age of the household head, livestock in tropical livestock unit, access to coffee marketing information and access to extension service relative to suppliers' outlet the base category. Therefore, these factors requires intervention and promotion by developing farmers' awareness about post-harvest handling, educating and training farmers; strengthening financial and market capacity of the cooperatives would increase farmers' choice towards cooperative outlet. Furthermore, establishing and facilitating market access, providing efficient, regular, timely and integrated extension service, improving infrastructure like communication and road to ensure farmers ability in accessing market and market information are recommended to improve farmers' outlet choice in the study area for future policy intervention.

Key words: Coffee · Marketing Margins · Outlet Choice · Smallholders · Multinomial Logit Model

INTRODUCTION

Coffee is one of the most important commodities in the world economy. The production of this commodity varies across regions. Coffee in particular is the backbone of the Ethiopian economy and is the leading commodity in generating foreign exchange for the country. Ethiopia is the origin of Arabica coffee and the world's fifth and Africa's leading producer. By its very nature, coffee is highly labor-intensive production activities. Very significant part of the population derives its livelihood from coffee. Coffee, thus, has a significant impact on the socio-economic life of the people and economic development of the country [1]. Coffee is produced in more than 60 countries providing income for smallholder producers. Ethiopia and Brazil are the only coffee producing countries that consume a significant portion of their production. Ethiopia is one of the few countries where coffee sale is not liberalized. That means buyers must purchase through the commodity exchange.

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Only cooperatives and large scale growers are exempt, but their coffee qualities are still checked by ECX (Ethiopia Commodity Exchange) laboratories. Coffee production is mainly in west and south Ethiopia, around 90% based on smallholder farmers [2].

In July 2008, a new law (Proclamation 702/2008) and the supporting regulation issued by the Council of Ministers replaced the existing coffee quality control and marketing legislation governing the sector for the past nearly four decades. The law stipulates that all coffee supply, with the exception of grower direct exports, are to be traded in the newly established Ethiopia Commodity Exchange [3]. ECX is setting up local marketplaces near farmers to make the market more efficient. There were several previous examples of buyers' not paying, coffee not being delivered from sellers and farmers suffering from forged checks. ECX has been implemented to eliminate these problems and to create a safe and secure market place to benefit for everyone. Farmers are now better informed about prices at the ECX through mobile phones and radio and are no longer cheated [4]. The cooperative unions are located in Addis Ababa and are exporting coffee directly, by passing the auction at ECX which is serving as a main coffee marketing outlet. They received market price plus Premiums for attributes such as quality, Fair Trade and organic certification. The Fair Trade premium is dealt with separately and is used for community projects such as roads, schools, equipment and electricity. The dividend structure is government controlled and is the same for all cooperatives. Dividends to farmers are paid out on an annual basis at low season [5]. When the union sells the coffee to foreign importing companies, 70% of the net profit is paid back to the primary cooperatives. In turn the primary cooperatives pay back 70% of their net profit as dividend to the farmers.

Ethiopia is currently producing an estimated 9.8 million bags that would rank the country as the third largest coffee producer in the world after Brazil and Vietnam, beating out Columbia [6]. Among agricultural export commodity, coffee is the leading and playing a lion share from total exports all the time representing 30 percent in 2017 according to Hika Wana and Nasir Ababulgu [7].

Although coffee is produced in many parts of Ethiopia most of the marketed coffee comes from the regions of Oromia and Southern Regional State. The two regions contribute for about 99 % of the total coffee production (64% from Oromia, 35% from SNNP) and the remaining 1% comes from Gambela Regional State [8]. To meet an ever increasing demand of coffee, the country is heavily dependent on the availability of adequate local supplies particularly from Jimma zone [9]. Jimma zone covers a total of 21% of the export share of the country and 43% of the export share of the Oromia Region.

Despite coffee is economically and socially crucial crop, coffee marketing outlets and its role on the improvement income for farmers have not yet been undertaken and assessed for the target study area. With respect to coffee marketing activities, various forms and extent of problems could be identified and prioritized, to decide upon them by the decision makers. To create good performing coffee producers and traders, it is essential to assess market outlets, analyze the performance of coffee actors by calculating margins and draw practical lesson on the critical operational problems and constrains. To accomplish such an important task, empirical investigations have paramount importance in areas of coffee marketing performance and factors affecting market outlet choice.

Therefore, this study intended to analyze the marketing of coffee in general, outlets used, marketing margins, determinants of smallholder farmers' channel choice decision and the variables affecting them in particular can be of a great importance in the development of sound policies with respect to coffee marketing, prices, exports and in meeting the overall rural and national development objectives of the country. Hence, it is imperative to analyze the determinants of market outlet choice of coffee farmers by identifying coffee marketing outlets, actors' marketing margins in the study area and point out potential factors on which policy should emphasize in the future.

MATERIALS AND METHODS

Seka chokorsa is one the district found in Jimma Zone known by producing coffee. The district extends between 7° 20' - 7°45' north latitude and 36°33' - 36°53' east longitudes. It is bordered with Gomma and Mena districts north; Kersa district in northeast; Dedo district in east; with SNNP district in south; Gera district in west and northwest; and Sombo Shabe district in the south west. The total surface area of the district is 85, 425 hectares and situated in the southern part of Jimma zone.

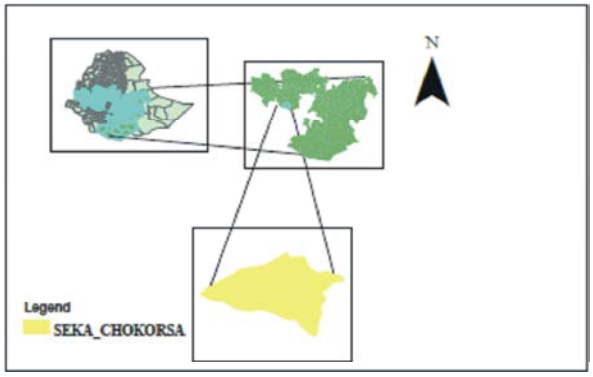

Fig. 1: Map of the study area

Seka Chokorsa district has a total population of 212, 619 during 2008 of which 107, 011(50.3%) were male and 105, 607(49.7%) were female. Most part of the district belongs to subtropical with the altitude of 1500-2300 m a.s.l (72%) and highland areas with the altitude ranges from 2300-2800 m a.s.l (21%) and the altitude below 1500 m a.s.l (7%) belongs to lowland. The western parts do have cool agro-climate with the mean annual temperature ranges of between 15-18°C and the vast part of the district is classified as subtropical with mean annual temperature ranges of between 18-22°C. The annual rainfall varies between 1300 mm and 1700 mm [10]. The location map of the study area is depicted hereunder.

Sampling Techniques: A two stage random sampling procedures were employed. Among the eight potential districts, Seka chokorsa district was selected purposively. Selecting representative sample kebeles is also an important criterion. Thus, in the first stage, with the consultation of the district agricultural experts and development agents, out of 34 coffee producing kebeles of the district, 3 coffee producers' kebeles namely Sakala genefo, Ilike tunjo and Gorantu alaga were selected randomly. In the second stage, based on the number of coffee producer households, 124 sample coffee producer households were selected from the sample kebeles using simple random sampling technique with probability proportional to size as in Table 1. In addition, suppliers were selected randomly whereas collectors, primary cooperatives, exporters and cooperative union were selected purposively even though only three main outlets were used in the study area since producers cannot sell coffee to Cooperative Unions and exporters directly who are situated in Addis Ababa which is far from smallholders.

Sample Size Determination: Since adequate size of sample is needed for the purpose of econometric analysis, sample size was determined using Yamane [11] formula. He developed the following equation to yield a representative sample for proportions. Hence, the sample size was determined based on the following formula given by Yamane [11].

$$n = \frac{N}{1 + N(e^2)} \quad (1)$$

where, n is sample size, N is the number of households in the district and e is the desired level of precision. By taking e as 9%, the total number of household was 40123 and therefore, the sample size was 124 sample households which were selected randomly.

Other actors like collectors, suppliers, cooperatives, exporters and union were also included. From the lists of 16 suppliers, 8 of them were selected randomly. Furthermore, 10 collectors, two primary cooperatives, two exporters and one cooperative union were selected purposively. Since there were not the recorded lists of collectors in the area, they were selected purposively and due to limited number of primary cooperatives in the study area, both of them were selected purposively.

Types, Sources and Methods of Data Collection: The data, both quantitative and qualitative types, needed for this study were collected from both primary and secondary sources. The primary data was obtained using informal and formal surveys. The formal survey was undertaken through formal interviews with randomly selected households and traders using a pre-tested semi-structured questionnaire for each group. The questionnaire was used for the data collection from smallholder farmers through trained enumerators. Qualitative data about business practices and transactions and the patterns and socio-economic activities of the farmers in the study area were gathered informally through direct observation of the study area and informal discussions with key informants like DAs, agriculture sector offices, administrators and ethnic leaders using checklists. In addition, secondary data were gathered from Central Statistics Agency (CSA), Bureau of Agriculture and Rural Development (BoARD) and other sources through reviewing and examination of reports as well as records of published and unpublished documents. Information on different variables such as data on coffee production, coffee marketed, prices of coffee supplied,

Table 1: Sample size distribution in the sample rural kebeles

Name of selected kebeles	Total number of coffee producer households	Number of sample households
Sakala genefo	1140	58
Ilike tunjo	1022	52
Gorantu alaga	275	14
Total	2437	124

Source: Own computation survey results, 2019

distance to market, distance from the market, age of the household head, extension service, educational status of the household head, household size, access to market information, credit facility and type of sellers and buyers, among others, were collected using the semi-structured questionnaire.

Method of Data Analysis

Analysis of producers' share and Coffee Marketing Margins: Estimates of the marketing margins are the best tools to analyze performance of market. Marketing margin was calculated by taking the difference between producers and traders prices. The producers' share is the commonly employed ratio calculated mathematically as, the ratio of producers' price to consumers' price. Mathematically, producers' share can be expressed as:

$$PS = \frac{P_p}{C_p} = 1 - \frac{MM}{C_p} \quad (1)$$

where:

PS = Producer's share
Pp = Producer's price
Cp = Consumer price
MM = Marketing margin

The above equation tells us that a higher marketing margin, diminishes producers share and vice versa. It also provides an indication of welfare distribution among production and marketing agents.

Calculating the total marketing margin was done by using the following formula. Computing the Total Gross Marketing Margin (TGMM) is always related to the final price paid by the end buyer and is expressed as a percentage [12].

$$TGMM = \frac{Consumer\ price - Producer\ Price}{Consumer\ Price} x100 \quad (2)$$

where, TGMM= Total Gross Marketing Margin.

From this measure, it is possible to see the allocative efficiency of markets. Higher profit of the marketing intermediaries reflects reduced downward and unfair income distribution, which depresses market participation of smallholders. An efficient marketing system is where the net margin is near to reasonable profit.

To find the benefit share of each actor the same concept was applied with some adjustments. In analyzing margins, first Total Gross Marketing Margin (TGMM) was calculated as depicted in equation (2). Then, marketing margin at a given stage 'i' (GMMi) was computed as:

$$GMM_i = \frac{SP_i - PP_i}{TGMM} X100 \quad (3)$$

where, SPi is selling price at i^{th} link and PPi is purchase price at i^{th} link.

Stage is the chain market at which different actors operates in the value chain like processing, wholesaling and retailing, while the link is the market in which purchasing and selling is carried out (example when retailer purchases the product from wholesaler and sell it).

Econometric Analysis Using Multinomial Logit Model Households' Marketing Channel Choice Decision: A multinomial logit (MNL) model was applied to explain inter household variation in the probability of choice of a specific market channel/outlet measured by volume of sales to each of the alternative outlets. This study assumes that farmer's decision is generated based on its utility maximization. This implies that each alternative marketing outlet choice entails different private costs and benefits and hence different utility, to a household decision maker. The analytical model is constructed as follows. Suppose that the utility to a household of alternative *j* is *Uij*, where j = 0, 1, 2…. From the decision maker's perspective, the best alternative is simply the one that maximizes net private benefit at the margin. In other words, household i will choose marketing outlet j if and only if *Uij* > *Uik*. It is important to note that household's utility cannot be observed in practice. What a researcher observe are the factors influencing the household's utility such as household and personal characteristics and attributes of the choice set experienced by the household. Based on McFadden [12], a household's utility function from using alternative j can then be expressed as follows:

U (Choice of j for household i) = Uij = Vij + εij (2)

where, Uij is the overall utility, Vij is an indirect utility function and εij is a random error term.

The probability that household i select alternative j can be specified as:

Pij = Pr (Vij + εij > Vik + εik)
Pij = Pr (εik < εij + Vij – Vik, $\forall\ k \neq j$) (3)

Assuming that the error terms are identically and independently distributed with type i extreme value distribution, the probability that a household chooses alternative j can be explained by a multinomial logit model [13] as follow:

$$P_{ij} = \frac{\exp(\beta_j X_{ij})}{\sum_{j=0}^{j} \exp(\beta_j X_{ij})} \quad (4)$$

where, Xij is a vector of household of the i^{th} respondent facing alternative j

βj is a vector of regression parameter estimates associated with alternative j. Following equation (4) above, we can adapt the MNL model fitting to this study as follows:

$$P(Choice_{ij} = j) = \frac{Exp(\beta_j X_i)}{\sum_{j=1}^{j} Exp(\beta_j X_i)} \quad (5)$$

where
i represents i^{th} farm household and i = 1, 2, 3, …, 124.
j represents different marketing outlets that were identified in the research process,
P represents the probability of coffee marketing outlet j to be chosen by farm household i;
CHOICE ij = means that coffee marketing outlet j is chosen by farm household i;
βj is a vector of regression parameter estimates associated with alternative j .
X refers to independent variables

It is a common practice in econometric specification of the MNL model to normalize equation (4) by one of the response categories such that $\beta j = 0$. In this regard, the MNL model can alternatively be specified as follow:

$$P_{ij} = \frac{\exp(\beta_j X_{ij})}{\sum_{j-1}^{j-1} \exp(\beta_j X_{ij})} \quad (6)$$

The coefficients of explanatory variables on the omitted or base category are assumed to be zero.

The probability that a base category is chosen can be calculated as follow s:

$$P_{ij} = \frac{1}{1 + \sum_{j-1}^{j-1} \exp(\beta_j X_{ij})} \quad (7)$$

The marginal effects of the attributes on probability of choice are determined by differentiating equation (4):

$$\delta_j = \frac{\partial P_j}{\partial X_i} = P_j = P_j \left[\beta_j - \sum_{j=0}^{j} (P_j)(\beta_j) \right], \text{for } j = 1,2,\ldots \ldots .. j \quad (8)$$

where, Pj is the probability that farmers choose market outlet j

βj is a vector of regression parameter estimates associated with alternative j.

The model predicts the relative probability that a producer would choose one of the three categories based on the nature of the explanatory variables. What should be noticed is that households may select and use greater than one channel in a given production year but they maximizes utility only from a single outlet at a time. Therefore, in this thesis the most probable channel used by the sample household is considered based on the household utility maximization from that outlet and its choice is independent from other alternatives since it is impossible to derive or maximize the same utility from different alternatives at the same time.

Multinomial logit model is only applicable if the conditions of Independent Irrelevant Alternative assumption is fulfilled [14]. IIA implies that the decision between two alternatives is independent from the existence of more alternatives. The validity of IIA assumption is also tested using Hausman's specification test. Following Green, the statistics is given as:

$$X^2 = (\hat{\beta}_s - \hat{\beta}_f)[\hat{V}_s - \hat{V}_f])(\hat{\beta}_s - \hat{\beta}_f) \quad (9)$$

where, s indicates estimators based on the restricted (constrained) subsets, f indicates estimators based on the full set of choices (Unconstrained). Therefore, $\hat{\beta}_s$ and $\hat{\beta}_f$ are the respective coefficients and $\hat{V}_s$ and $\hat{V}_f$ are the respective estimated covariance matrices. Multinomial Logit Model is well suited and convincing if supported by decision making theory and utility theory.

Theoretical Perspectives: Decision Making Theory and Utility Theory

Decision Making Theory: Decision theory or theory of choice in economics and other fields of study is concerned with identifying the values, uncertainties and other issues relevant in a given decision, its rationality and the resulting optimal decision. It is concerned with the choices of individual agents. Rational decision making brings a structured or reasonable thought process to the act of deciding. The choice to decide rationally makes it possible to support the decision maker by making the knowledge involved with the choice open and specific.

Decision making will follow a process or orderly path from problem to solution. There is a single best or optimal outcome. Rational decisions seek to optimize or maximize utility. The chosen solution will be in agreement with the preferences and beliefs of the decision maker. The rational choice will satisfy conditions of logical consistency and deductive completeness. Decision making will be objective, unbiased and based on facts. Information is gathered for analysis during the decision making process. Future consequences are considered for each decision alternative. Structured questions are used to promote a broad and deep analysis of the situation or problem requiring a solution.

In rational choice theories, individuals are seen as motivated by the wants or goals that express their 'preferences'. They act within specific, given constraints and on the basis of the information that they have about the conditions under which they are acting. As it is not possible for individuals to achieve all of the various things that they want, they must also make choices in relation to both their goals and the means for attaining these goals. Rational choice theories hold that individuals must anticipate the outcomes of alternative courses of action and calculate that which will be best for them. Rational individuals choose the alternative that is likely to give them the greatest satisfaction [15].

An optimal decision is a decision such that no other available decision options will lead to a better outcome. It is an important concept in decision theory. In order to compare the different decision outcomes, one commonly assigns a relative utility to each of them. If there is uncertainty in what the outcome will be, the optimal decision maximizes the expected utility (utility averaged over all possible outcomes of a decision). Sometimes, the equivalent problem of minimizing loss is considered, particularly in financial situations, where the utility is defined as economic gain. "Utility" is only an arbitrary term for quantifying the desirability of a particular decision outcome and not necessarily related to "usefulness."

Utility Theory: Utility theory is based on the assumption of rationality and describes all decision outcomes (financial and otherwise) in terms of the utility (or value) placed on them by individuals. Within this framework decision can be understood in terms of rationality ordered levels of utility attached to different outcomes. Mekonin Abera [16], for example, describes a formally rational decision process for arriving at a decision with the greatest expected utility in the following terms: Define the problem, identify the decision criteria, weight the criteria, generate the alternatives, rate each alternative on each criteria and finally compute the optimal decision. More sophisticated versions of such decision processes allow for calculation of probabilities for different possible outcomes associated with each alternative and the weighting of the utility of those outcomes by their probability. These are the guiding decision/choice theories in rational decision making process for different alternatives based on the utility attached to these outcomes. Decision or choice for the alternative is made when the utility placed on it by individual is maximized. Rational individuals choose the alternative that is likely to give them the greatest satisfaction as it is impossible for them to attain the same utility from different alternatives given the constraints and information they have and hence, the choice is made for a single alternative at a time.

Conceptual Framework: The study focus on identifying coffee marketing outlet and analyzing determinants affecting outlet choice at smallholder farmers' level to deliver the information needed and to close the gap by critically searching the problems on the area in the study area that used to inform the concerned body to formulate policy for intervention. Therefore, a great attempt is given to strengthen the study through supporting the concept by decision making and utility theories and empery to support the results. Hence, for this study the conceptual framework is drawn hereunder.

Analytical Framework: Models, which include a "yes" or "no" type dependent variable, are called dichotomous. Such models approximate the mathematical relationships between explanatory variables and the dependent variable

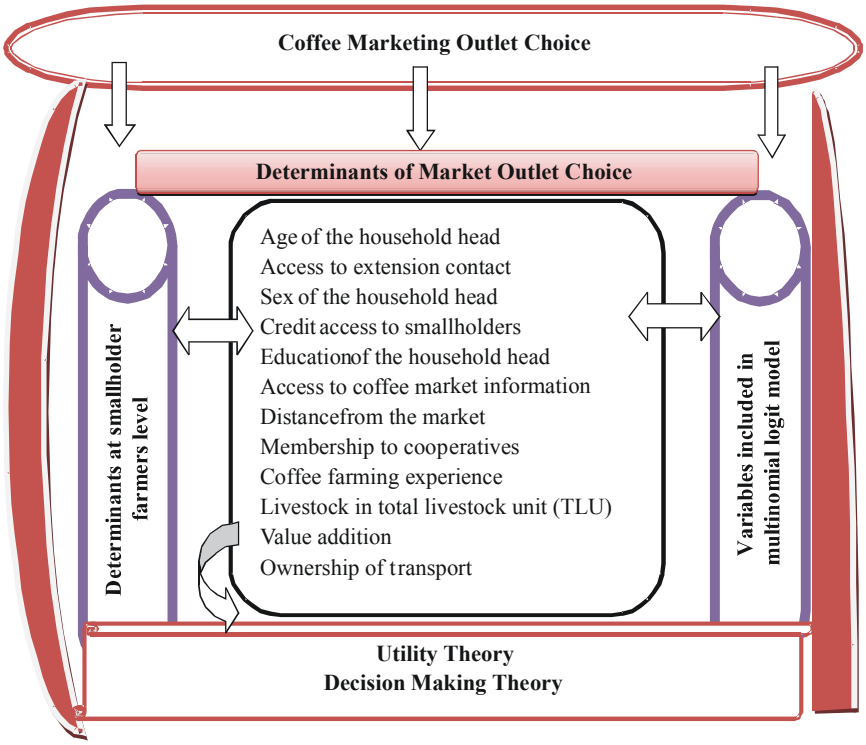

Fig. 2: Conceptual framework of the study
Source: Own Sketch, 2019

that is always assigned qualitative response variables. The four most commonly used approaches to estimate dummy dependent variable regression models are (1) the linear probability model (LPM), (2) the logit, (3) the probit and (4) the tobit model. They are applicable in a wide variety of fields [17]. The probability model, which expresses the dichotomous dependent variable (Yi) as a linear function of the explanatory variables (Xi), is called linear probability model (LPM). LPM has some econometric like non normality of the disturbances (Ui), heteroscedastic variances of the disturbances, non-fulfillment of $0<E(Yi/Xi)<1$ and lower value of R^2, as a measure of goodness of fit. Therefore, linear probability model is not appropriate to test the statistical significance of estimated coefficients according to Gujarati. The logit and probit models will guarantee that the estimated probabilities will lie between logical limit 0 and 1.

In principle, a multivariate model would extend to more than two outcome variable. The practical obstacle to such an extension is primarily the evaluation of higher-order multivariate normal integrals. Some progress have been made on using quadrature for trivariate integration, but existing results are not sufficient to allow accurate and efficient evaluation for more than two variables in a sample of even moderate size as shown by Greene [14]. This is applied only for small number of alternatives (at most three or four), because the computation involve evaluating multiple integrals. The over parameterized error correction models for the economic growth model equation is set at three to ensure that the dynamics of the models are not constrained by too short lag length. However, these models seem difficult to interpret; therefore these models were reduced to a more interpretable and certainly more parsimonious models [18]. Co-integration implies that in spite of being individually not stationary, a linear set of two or more time series could be stationary. In fact, regression analysis may fails when including non-stationary variables, leading to spurious regressions that confirm the existence of relationships even when there are none [19]. Because of different limitations of the above models, they are not appropriate to be used in this thesis.

However, MNLM is an extension of binary logit model and is most frequently used nominal regression model. This model is more applicable and has been used to study choices of transportation models, to study the number of automobiles demanded, to study the structure of asset portfolios of house and to study the determinants of occupational study. Schmidt [20] considered the multinomial logit model with individual characteristics:

education, experience, race and sex. Hence, this study applied multinomial logit model in analyzing determinants of households' channel choice decision to use the advantage over the other in the analysis of polychotomous outcomes variables in that it is flexible and easily usable model for unordered categorical dependent variable. Multinomial Logit Model works if a decision between multiple alternatives is truly made simultaneously. That is, alternative categories must be independent or mutually exclusive.

RESULTS AND DISCUSSION

Descriptive Results

Current Coffee Market Outlets Used by Smallholders in the District: The analysis of coffee marketing channels or outlets is intended to provide a systematic knowledge of the flow of coffee from the producer to the final destination (consumer). Coffee passes through several stages before it reaches the ultimate consumers. Rural households sell their coffee to the market place. They sell their coffee in the form of sun-dried cherry (locally named as *Jenfel*) after drying and storing for some months. There were some farmers who used to sell their coffee in the form of *kashir* (refers to locally hulled coffee) because of its price advantages over *Jenfel.* But, recently such practices are forbidden by the district office of agriculture. The reason is that manually hulled, *kashir* contains significant amount of broken coffee beans which is usually purchased by illegal traders and mixed with better quality coffee to earn higher price margin. The main purchasers of coffee in the area are suppliers, cooperatives and coffee collectors in the given order as summarized below. Coffee suppliers purchase a large amount of sun dried coffee either directly or through their agents. Cooperatives were the next largest purchasers of sundried coffee followed by coffee collectors.

According to the survey results, the dominant purchasers of sun dried coffee in the district are coffee suppliers or wholesalers, primary cooperatives and coffee collectors. In choosing buyers, most farmers (65%) reported that price is the primary decision variable. Selling to coffee collectors is easier, since the time and cost of transportation required in the exchange process are less demanding. However, the price and the weighing scale of suppliers are considered to be attractive and preferable.

The survey revealed that 41.1% (51 sample households) sold their sundried coffee to wholesalers/suppliers. About 41 households (33.1%) reported to have sold to cooperatives. They do also sell sun-dried coffee to coffee collectors. In this respect, about 25.8% of the sample households reported to have sold their coffee to coffee collectors. Retailers and consumers purchase the rejected coffee and what is supplied by women and children in small quantities. Women and children sell less significant amount of sundried coffee to retailers and consumers that is why this outlet is not included in the channels.

The major reason why farmers sell to coffee collectors is the fact that these traders are sometimes willing to offer a better price and collect coffee from farm gates reducing the transportation and other costs that could have been incurred by the producers (Table 2).

Suppliers or Wholesalers: Suppliers are the strong actors in coffee marketing, they have license from district trade and market development office and granted certificate of capability in coffee trade from district agriculture office and purchase coffee in large amount. They buy coffee either from producers at primary coffee markets or from collectors or from their agents. Then they add value through processing such as cleaning and drying; and supply coffee to ECX warehouse at Jimma branch for inspection of quality and grading. Finally they pass the product to export market through their agent in ECX, who possesses a seat in ECX and who charges about 0.5% of the revenue for the service rendered. From Table 2 above, suppliers are purchasing coffee from producers in large quantities about 18, 396.55kg or 41% of coffee marketed in the area excluding what they buy from collectors and/or their agents.

Retailers and Consumers: Retailers and consumers are not included in this outlet because coffee marketing is regulated by government in which coffee producers are allowed to sell their coffee only to licensed traders like wholesalers, cooperatives and collectors. Retailers and consumers purchase the rejected coffee and what is supplied by women and children in small quantities. Women and children sell less significant amount of sundried coffee to retailers and consumers that is why this outlet is not included in the channels.

Producers' Share and Marketing Margins of Coffee Market Outlets: Three major or primary outlets (wholesalers/suppliers, cooperatives and collectors) chosen by producers to which they sell their coffee are focused and marketing margins analysis are made.

Table 2: Proportion of sample households who sold sundried coffee to different outlets

Agents or outlets	Number of households	Percentage (%)	Quantity sold in Kg
Suppliers	51	41.1	18, 396.55
Cooperatives	41	33.1	14, 816.35
Collectors	32	25.8	11, 548.10
Total	124	100	44, 761.00

Source: Own computation results, 2019

Table 3: Marketing margins and benefit shares of actors in coffee marketing

Items (Birr/85kg)	Producers	Collectors	Cooperatives	Suppliers
Purchase prices	-	1445	1700	1700
Production cost	509.70	-	-	-
Marketing cost	128.40	139.5	196.25	198.75
Total cost	638.1	139.5	196.25	198.75
Sale prices	1572.5	1700	2252.5	2210
Marketing margin	1062.8	255	552.5	510
% share of margin	28	7	15	14

Source: Own computation results, 2019

In addition, producers' share was calculated to identify the beneficiaries at the expense of producers in coffee marketing. To calculate marketing margins including producers share purchase prices, production cost, marketing cost and sale prices were used.

It is obvious that production cost is incurred only by producers which account 509.70ETB with marketing cost of 128.40ETB together 638.1ETB are incurred by producers per 85kg or quintal of sundried coffee. These costs are very high almost more than half of the overall costs in coffee marketing relative to costs incurred by traders or primary outlets (Table 3). The purchase prices of collectors, cooperatives and suppliers are 1445, 1700 and 1700ETB per 85kg of sundried coffee, respectively and the sale prices of producers, collectors and suppliers are 1572.5, 1700, 2252.5 and 2210ETB per 85kg of sundried coffee, respectively. The analysis of marketing margins from table 3 showed that the producers share, marketing margins of collectors, cooperatives and wholesalers/suppliers are 1062.8ETB (28%), 255ETB (7%), 552.5ETB (15%) and 510ETB (14% share of margin), respectively.

Even though producers incur high costs; large amounts of production costs, they are not obtaining fair and seasonable margins. Hence, there is a need to intervene in this gap to increase producers' share of margins in the area through supplying inputs at low price which in turn reduces production costs.

The study by Hika Wana and T. Anteneh [21] showed that the average purchase and export price for exporters is about 40.5 and 47.5 birr per kg respectively. The average marketing costs for exporters from auction market until it reaches Djibouti port is 3.14 birr per kg with the net marketing margin of 3.66 Birr /kg.

Econometric Results

Determinants of Coffee Market Outlet Choices: The multinomial logit model specified three most widely chosen and used channels by the sample households with suppliers' market outlet as the base category and was tested for the independence of irrelevant alternatives (IIA) assumption based on Hausman test. The hypothesis that all the coefficients except the constant are zero is rejected at 1 percent level based on the Wald test. The model explained 21% of the variation in market channel choice is due to variation among coffee producing households.

Table 4 below presents the coefficients from multinomial logit regression on the existing alternative marketing outlets in the sample and the marginal effects. According to Greene [22], the coefficient values measures the expected change in the logit for a unit change in the corresponding independent variable, other independent variables being equal. The sign of the coefficient shows the direction of influence of the variable on the logit. It follows that a positive value indicates an increase in the likelihood that a household will change to the alternative option from the baseline group. The result showed that some of the variables were significant at one market outlet while some others were significant in the other marketing outlet/channel. Compared to the base category (supplier) age, livestock in tropical livestock unit, access to coffee market information and access to extension contact determined the selection of collector as market options while the variables such as coffee farming experience distance from the nearest market, educational level of household head and postharvest value addition affected the choice of cooperative outlet.

Table 4: Coefficients and Marginal effects of Multinomial Logit Model for the choice of market outlet

	Channels/outlets									
	Cooperatives (41)			Collectors (32)			Cooperative		Collectors	
Variables	Coef.	Robust Std. Err	P>|z|	Coef.	Robust Std. Err	P>|z|	dy/dx	Std. Err.	dy/dx	Std. Err.
Age	-0.018	0.025	0.472	0.056**	0.027	0.041	-.005	.006	.02	.001
Sex	0.407	0.886	0.646	-0.772	0.881	0.381	.099	.180	-.037	.050
Distance	-2.206	1.376	0.109	1.975	2.005	0.325	-.535	.316	.078	.050
Experience	-0.095*	0.053	0.073	0.071	0.073	0.330	-.023	.012	.003	.002
M/shipCoop	0.076	0.904	0.933	0.786	1.014	0.438	.009	.209	.021	.030
Credit	-1.201	1.211	0.321	-0.096	1.346	0.943	-.223	.164	.007	.044
TLU	-0.068	0.101	0.503	-0.308*	0.166	0.063	-.013	.023	-.008	.005
Education	-1.299**	0.659	0.049	0.625	0.667	0.349	-.301	.141	.031	.020
Transport	0.619	0.849	0.466	0.622	0.979	0.525	.140	.200	.011	.030
Information	-0.080	1.026	0.938	-13.55***	1.466	0.000	.048	.234	-.174	.057
Extension	0.247	0.840	0.769	-2.337*	1.271	0.066	.079	.193	-.058	.030
Value add	1.353*	0.746	0.070	-0.655	0.615	0.286	.281	.122	-.039	.028
-cons	5.133	3.854	0.183	-6.044	5.104	0.769				

Supplier or wholesale outlet is the base outcome/category. dy/ dx is marginal effect. N=124, Wald chi2 (24) = 1626.25***, Pseudo R^2=0.21. Log likelihood = -105.97. ***, ** and * are statistically significant at 1%, 5% and 10%, respectively.

Source: Own computation results, 2019

The positive estimated coefficients of a variable indicates that the probability of the producers being in either supplying to collector market channel or cooperative market outlet relative to supplying to supplier market outlet increases as the marginal effect coefficient of these explanatory variables increase. The implication is that the probability of the producers to be on these outcomes is greater than the probability of being supplier outlet (the base category). The negative and significant parameter indicates the probability of using supplier outlet is higher than the probability of being in the two alternatives. Estimates not significantly different from zero indicate that the explanatory variable concerned does not affect the probability of the producers decision to use supplier outlet category than in the other two categories. The Stata software used the alternative "supplier" as a base category (bench mark alternative) depending on the number of farmers' choice. This implies that the discussion of the results focuses on the impact of the explanatory variables on the use of cooperative and collector category relative to the use of suppliers the base category. The result of the multinomial logit and marginal effects and their possible explanations are presented below.

Cooperative Outlet Compared to Supplier Outlet

Coffee Farming Experience: This influences the choice of cooperative outlet negatively and significantly at 10% significance level. As coffee farming experience of the household increases by one year, the probability of choosing cooperative market than supplier market decreases by 2.3% implying that the coffee producers sell less coffee in the cooperative market as compared to the supplier outlet, holding other things equal. This might be due to the reason that, farmers who have more coffee farming experience would have long time relationship with suppliers for market, credit and other services while cooperative is the recent phenomena and hence, not strong financially and other services delivery.

Education of the Household Head: This variable was negatively and significantly related with cooperative outlet choice at 5% significance level. The result also confirmed that, if the household head is educated, the probability of choosing cooperative outlet decreases by 30.1% implying that the households sell fewer amounts of coffee to the cooperative outlet relative to supplier outlet the base outcome, other things kept constant. Education is related with the best market outlet because as the education level increases farmers' ability to search better market from which they fetch better price for their product also increases and strengthen the linkage with suppliers. This result is in line with Abraham [23] who found that education of the household head is negatively and significantly related with retail outlet choice in vegetable marketing. He found that if the household head is educated, the probability of choice of retail outlet decreases. It is also in line with Anteneh *et al.* [24] who found that younger coffee farmers, with better education, higher proportion of off-farm income to total income and higher proportion of land allocated to coffee tend to diversify their market choices by selling to traders.

Post-Harvest Value Addition: Value addition was positively and significantly related to cooperative market outlet at 10% significance level. Farmers who have practiced better postharvest handling choose cooperative market outlet relative to referent group. The result showed that as farmers practice better value adding activities, the probability of choosing cooperative outlet increases by 28.1% compared to supplier outlet the base category, other factors remaining constant. The most probable reason might be concerned with the quality of the product in which better quality coffee is demanded by the cooperative to export or to get better market and they might have better relationship with those households supplying better quality product. This is in line with the study of Abraham [23] who found that if farmers practice value adding activities in vegetable marketing, the probability of choosing collector outlet decreases.

Collector Outlet Relative to Supplier Outlet (The Referent Category)

Age of the Household Head: It was found to affect the use of collector outlet positively and significantly. Holding other variables constant, as the age of a household increases by one year, the probability of choosing collector outlet compared to supplier increases by 2% implying coffee producing farmers sell more coffee to collectors relative to the base group. This might be due to the fact that aged household are weak and unable to go far market center which put their choice on using the one available nearby since suppliers are situated in the town where they can easily transport coffee to auction market while farmers are far away from them being constrained by different factors. This is in line with Bongiwe and Masuku [25] who found that age of the farmers was significant determinant of the choice to use non-wholesale market channel over other-wholesale market channel.

Livestock Owned in TLU: Collector channel choice was also determined by the number of livestock owned in tropical livestock unit by sample households in the study area. It was negatively and significantly associated to collector outlet choice at 10% significance level. Putting all other determinants unvaried, an increase in TLU for coffee growing farmers decreases the likelihood of choosing collector by a .8% unit relative to supplier referent outcome. This shows that the availability of livestock would increase the ability of the households in covering transportation cost or to buy transport animals, offering greater depth in marketing choices. This is in line with Hika wana and Asfew Lemessa [26] who found that the farmer who possesses more number of livestock will have more money to purchase agricultural inputs and again has the chance to get oxen for draught power.

Access to Coffee Market Information: This variable affected the choice of collector outlet negatively and significantly at 1% significance level. Compared to supplier outlet the base category, the probability of choosing collector outlet relative to supplier decreases by 17.4% for the household who have access to coffee market information, other things are kept constant. This is due to the reason that households marketing decisions are based on market price information and poorly integrated markets may convey inaccurate price information, leading to inefficient product movement. Again, business decisions are based on dynamic information such as consumer needs and market trends [27]. Coffee producers who have access to market information tend to choose the best outlet. This is inline with Geoffrey [28], the result of multinomial logistic regression revealed that price information significantly influenced the choice of pineapple marketing outlets.

Access to Extension Contact: It was negatively and significantly associated with the use of collector channel at 5% significance level. Other thing being equal, the probability of using collector outlet compared to supplier outlet would be lower by 5.8% for households having access to extension contact relative to using supplier outlet. This is might be due to farmer's access to extension contact service increased the ability of farmers to acquire and implement important market information as well as other related agricultural information which in turn increases farmer's ability to choose the best market outlets for their produce. This result is in line with Mamo Girma and Degnet Abebaw [29] who found agricultural extension services in the form of visit of farmers by extension officers tended to increase the probability of selling directly to consumers in livestock market channel choice of farmers in Ethiopia. It is also in line with Abraham [23] found that for the households having extension service, the likelihood of choosing collector outlet decreases relative to the base category.

CONCLUSION AND RECOMMENDATION

According to the survey results, the dominant purchasers of sun dried coffee in the district are coffee suppliers (18, 396.55kg), primary cooperatives (14, 816.35kg) and coffee collectors (11, 548.1kg)

indicating a large amount of coffee were sold to suppliers outlet which is followed by cooperatives and then collectors. The major reason why farmers sell coffee to collectors is the fact that these traders collect coffee from farm gates which reduce the transportation and other costs that could have been incurred by the producers and hence, the government should facilitate market outlet at farm level by licensing illegal collators to tackle transportation problem of the smallholders. Retailers and consumers purchase the rejected coffee and what is supplied by women and children in small quantities.

The analysis of marketing margins from table 3 showed that the producers share, marketing margins of collectors, cooperatives and wholesalers/suppliers are 1062.8ETB (28%), 255ETB (7%), 552.5ETB (15%) and 510ETB (14% share of margin), respectively. It is known that production cost is incurred only by producers which account 509.70ETB with marketing cost of 128.40ETB together 638.1ETB are incurred by producers per 85kg or quintal of sundried coffee. These costs are very high almost more than half of the overall costs in coffee marketing relative to costs incurred by traders or primary outlets Even though producers incur high costs; large amounts of production costs, they are not obtaining fair and seasonable margins. Hence, there is a need to intervene in this gap to increase producers' share of margins in the area through supplying inputs at low price which in turn reduces production costs.

The results of multinomial logit model showed that the probability of choosing cooperatives outlet is negatively and significantly affected by coffee farming experience and education of the household head; and affected by post-harvest value addition positively and significantly relative to supplier outlet. Therefore, these factors needs to be promoted by developing farmers' awareness about marketing and post-harvest handling, developing storage infrastructure and coordinating fragmented producers in cooperatives; and educating, training and creating awareness for farmers about the benefits of the cooperatives in marketing as the best option of market choice since it is the recent phenomena in the study area and farmers have long relations with suppliers for market and loan. Furthermore, strengthening financial and market capacity of the cooperatives in the study area would increase farmers' choice towards cooperative outlet.

Similarly, the probability to choose collector outlet is significantly and positively affected by age of the household head relative to supplier outlet. Therefore, establishing and facilitating market access can improve market choice of the household especially old-aged in this regard through improving transportation access by developing road infrastructures. Collector outlet choice is also negatively and significantly affected by livestock in tropical livestock unit, access to extension contact and coffee market information. Therefore, providing efficient, regular, timely and integrated extension service, improving infrastructure like communication and road to ensure farmers ability in accessing market and market information, supporting development agents by giving continuous capacity building trainings and initiating development agents' in disseminating market information in addition to their work have significant effect on farmers channel choice. Hence, all these factors must be considered and promoted in future intervention.

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APPENDIXES

Appendix Table 1: Sources of inputs for coffee production in the study area

Sources	Number of households	Percentage
Office of Agriculture and Rural development	94	75.8
Private seedling producers	14	11.3
Jimma research center	7	5.6
NGOs	6	4.8
Cooperative	3	2.4
Total	124	100.0

Source: Own computation results, 2019

Appendix Table 2: Access and sources of extension contact and market information by sample households

Variables	Items	Number	Percentage
Training	Yes	82	66
	No	42	40
	Total	124	100
Extension contact	Yes	43	34.7
	No	81	65.3
	Total	124	100
Credit access	Yes	4	3.2
	No	120	96.8
	Total	124	100
Cooperative membership	Yes	63	50.8
	No	61	49.2
	Total	124	100
Extension service provider and Source of market information			
Source of market information	From the market	48	45.3
	Radio	26	24.5
	From other farmers	21	19.8
	Das	11	10.4
	Total	106	100
Extension service provider	Das	30	69.8
	District OoARD Experts	13	30.2
	Total	43	100

Source: Own computation results, 2019

Appendix Table 3: Hausman tests of IIA assumption for multinomial logit model

Alternatives	Chi2	Df	p>chi2	evidence
Collectors	0.87	13	1.000	For Ho
Suppliers	0.00	16	1.000	For Ho
Cooperatives	2.75	6	0.8390	For Ho

Appendix Table 4: Conversion factors used to compute tropical livestock units (TLU)

Livestock Category	Conversion factor
Calf	0.25
Weaned calf	0.34
Heifer	0.75
Cow or ox	1.00
Horse/mule	1.10
Donkey (adult)	0.70
Donkey (young)	0.35
Camel	1.25
Sheep or goat (adult)	0.13
Sheep or goat (young)	0.06
Chicken	0.013
Bull	0.75

Source: Storck, *et al*., 1991