



## Analysis of Edible Oilseeds Market Outlet Choices by Smallholder Farmers

Admkew Mangesha\*, Kedir Jemal

Department of Agriculture and Environmental Sciences, Haramaya University, Dire Dawa, Ethiopia

### ABSTRACT

Smallholder's market outlet choice is an important specific decision they made. The small holder farmers to secure high returns by choosing the market outlets that optimize their return from the sale of the output. However, the choice among the market alternatives is not mutually exclusive as producers could sell at more than one market outlet and the random error terms of the market outlets may be correlated. A multivariate probit model was adopted to examine the determinants of market outlet choices. The results of the study showed that the 142 (77.17%) were male-headed, 54.89% the small holder farmers were a cooperative member, 77.72% and 61.41% of the small holders have access to market information's and access to credits respectively, the average age of the household head of was 39.848 years, the average educational back ground of the household heads was 5.67 years and the average distance from home to the whole sale/main market place where farmers sold their edible seeds produce was an average of 16.679 kilometers with standard deviation of 4.435 and the average amount of edible oilseeds was 8.521 with standard deviations of 4.665. The multivariate probit model result indicated that household ages was influenced farm gates and wholesaler positively significant at 5% and negatively significantly at 10% respectively, house hold heads sex is negatively significant at 5%, credit access is influenced the farm gate and whole sale market outlet choice was negatively significant at 10% and positively significant at 1%, educational level of household head influenced the retail market outlet choice positively significant at 10% level while, family size was wholesaler market out let choice was negatively significant at 1%, land allocated and farm yield in quintals significantly influenced edible oil seeds producers' choice of alternative market outlets. Therefore, strategies aiming at promoting edible oil seed producers' marketing outlet choices should focus on strengthening the technical skills, resource base, infrastructural and institutional capacity of smallholder farmers.

**Keywords:** Market outlet choice; Edible oilseeds; Multivariate probit model; Producers

<b>Received:</b>	14-June-2023	<b>Manuscript No:</b>	IPIAS-23-17756
<b>Editor assigned:</b>	19-June-2023	<b>PreQC No:</b>	IPIAS-23-17756 (PQ)
<b>Reviewed:</b>	03-July-2023	<b>QC No:</b>	IPIAS-23-17756
<b>Revised:</b>	13-September-2023	<b>Manuscript No:</b>	IPIAS-23-17756 (R)
<b>Published:</b>	11-October-2023	<b>DOI</b>	10.36648/2394-9988-10.4.38

**Corresponding author:** Admkew Mangesha, Department of Agriculture and Environmental Sciences, Haramaya University, Dire Dawa, Ethiopia; E-mail: yadeniadmke@gmail.com

**Citation:** Mangesha A, Jemal K (2023) Analysis of Edible Oilseeds Market Outlet Choices by Smallholder Farmers. Int J Appl Sci Res Rev. 10:38.

**Copyright:** © 2023 Mangesha A, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## INTRODUCTION

### Background of the Study

Strengthening agriculture development in Africa is considered as the flagship guiding strategy and it remains the key leading economic sector. In sub-Saharan Africa, agricultural production and productivity relatively lower than the global average with its rapidly growing population. Subsistence production system is the sources of livelihood for a majority of smallholder farmers in developing countries. On average small holder farmer countries like, Ethiopia, Kenya, Uganda and Tanzania smallholder accounts for about 75% of agricultural production. About 80% of Ethiopian populations are smallholder farmers, which depend on subsistent agriculture for their livelihoods.

Edible oilseeds are one of a cash crops and major source of export revenue and livelihood basis for millions of rural farmers in Africa. In East Africa oilseeds are backbone for agro-industries and export. In Ethiopia, it represents about 20% of the total foreign exchange earnings. Oil crops are mainly produced Oromia, Amhara, Tigray and Benishangul Gumuz states about 0.86 million hectares, involving close to 4 million smallholder producers. Sesame, niger seed and linseed are main oilseed crops while safflower, groundnuts, rapeseed, sunflower, soybean and cotton oilseed are produced in small quantitie [1].

About 86% of oilseeds production falls in the range of less than 5 hectares. Holdings of greater than 5 and less than 10 hectares account for 12%. Holdings of greater than 10 hectares account for a mere less than 2% of the total estimated area under oilseeds productions. In Ethiopia the oilseeds sector is one of fastest growing and important agricultural sectors both in terms of its foreign exchange earnings and as a main source of income for nearly 4 million farmers and also a number of traders, transporters and oil millers. In Ethiopia, oilseed constitutes an important agricultural product for the rural economy. It provides higher returns to labor than food grains, promote smallholder's income growth, food security and national foreign exchange generation for the domestic economy by serving as a main raw material for local edible oil processing industries. Thus, increasing the extent of commercialization among smallholder farmers is playing a crucial role in poverty alleviation. Finance and investment are required to create additional income generating activities for smallholders' farmers and link to the agro-processing industry. Enhancing access to markets outlets improve the smallholder's food security and welfare. There are critical edible oilseeds supply shortages for edible oil industry, in spite of adequate potential in Africa. Oilseed shortage are a serious challenges of the countries edible oil industry. Weak market accesses and fragmented land holdings and small-scale farming practice are the main constrained for edible oilseeds productions. Low use of agro-inputs and poor farm management as well as lack of market-oriented production and high cost and limited availability of inputs are contributing for overall low productivity. In additions, backward agricultural practices,

lack of improved seed, fertilizer and chemical, high costs and limited accessibility of inputs, lack of credit facilities and uncertainty about economic returns are the major problems of production of oil seed sector among more other.

Strengthening all actors along the complete agricultural value chain and private institutions including seed enterprise, farmer, cooperatives and unions, agricultural processors, traders, aggregators, rural credit providers and a favorable marketing environment to operate effectively. Production and marketing of these crops were constrained with marketing problems such as, low bargaining power arising from lack of alternative market outlets, low price for the produce specially during the harvesting season, poor infrastructure, poor handling and storage facilities and lack of marketing information.

The country's edible oil factories contribute less than 20% of the total consumption and 80% is recipient as food aid and import for local consumption. Ethiopia is major source of edible oilseeds that holds significant promise for improving rural livelihoods and the productivity of the oilseed appears to be almost stagnant over years, since the producers have no proper access to the final market and lacked knowledge on how to add value before it is supplied to the market. Efficient and well-functioning market and the corresponding infrastructure keeping the transaction costs low and minimizing risk particularly for the poor living in the rural areas with low productivity and weak infrastructure.

Limited market outlets, limited efforts in market linkage activities and poor market information among actors are main challenges of edible oilseeds production. According to Fanta et al., most agricultural marketing channels in developing countries are long and complex with high transaction costs that considerably lower the farmers' share of the consumer price. Smallholders' decision to choose an appropriate market outlet is an important farm household specific decision. However, the smallholders' decision to sell their produce in a different market outlet is made by evaluating the return in expected utility of each market outlet. In addition, accessibility of market outlets also plays an important role in influencing producers' decision to choose and participate in alternative market outlets. The market outlet choice among the market alternatives is not mutually exclusive, as producers could sell at more than one market outlet at the same time and the random error terms of the market outlets may be correlated. Most of the previously research studied are vegetables and fruits focused on the examination of the determinants of market outlet choices without considering the potential correlation among unobserved disturbances and the relationship between the choices of different market outlets. Thus, competitive and integrated efficient and effective marketing outlet. Therefore, this study has attempted identify factors affecting the farmer market outlet choice. The general objective of this study was to identify and analyze factors affecting market outlet choices of edible oilseeds specifically; to describe the farmers' demographic and socioeconomic characteristics and to identify factors affecting edible oil seeds market outlet choices [2].

## MATERIALS AND METHODS

### Edible Oil Production and its Economic Importance

Edible oilseeds are important crops in world due to its economic benefits for farmers and agroindustry. Major worldwide edible oilseeds are soybean, rapeseed, cottonseed, safflower seed, groundnut, palm, opera, sesame, castor-seed, maize oil and coconut oil. USA, China, Brazil, India, Malaysia, Indonesia, European countries, Central Europe, Canada and Argentina are accounting 70% of world oilseeds productions and Indonesia, Malaysia, Argentina and Brazil are dominating the world export market compared to the others.

According to Voora, et al., palm, soybean and rapeseed are the main edible oilseeds in the world market that accounts about 75% of the total production. Globally, soybean accounts the biggest oilseed crop coverage and also the largest share of both oil and meal markets. As the world population increased, demand for oilseeds continues to grow. Oilseeds are the third most important commodity in terms of production and export in Ethiopia. Oil crops were cultivated in about 0.86 million hectares involving close to four million smallholder farmers in the main production areas. It constitutes 7% of the total area under grain crops and 3% of the total grain production. 86% of the sizes of holdings under oil seeds production fell in the range of less than five hectares, holdings of greater than 5 and less than 10 hectares accounted for twelve percent and those greater than 10 hectares accounted for less than 2% of the total estimated area under oilseeds.

Unlike any other grain crops in Ethiopia, around 50% of the oilseeds produced marketed while 35% used for farmer consumption and 15% kept as a seed for the next season. Even though emphases are given by the government and other collaborators, edible oilseeds from farmer to industry value chain is facing critical challenges in Ethiopia. The actual productivity of edible oilseeds is very low when compared to other crops. On the contrary to this, the demand for edible oilseeds substantially increased to serve both the domestic and international markets. Currently in Ethiopia, farmers are improving their fertilizer use as well as land preparation due to gaining more and more the values from productions, but due to poor collection, storage and transportation facilities, farmers are not benefiting from their production.

On the other side, distribution and marketing of edible oilseed is mainly done by small holder and medium scale trader with poor facilities which may cause to post-harvest losses. As well as relatively low volumes with high handling and transport costs are considered the main challenges of edible oilseeds producer. The oilseed effective and efficient marketing chain is very important for value chain actors and discourage the non-value adding intermediaries. The oilseeds value chain makes an important contribution for the country's economy and chain actors particularly for small farmers, traders, transporters and oil millers.

Ethiopian smallholders account for about 97% of the total area cultivated and more than 96% of the overall agricultural production. To produce oil seed or any other crop is based on

very limited information and experience. Oil millers and the seed collectors need an organized approach to deal with the individual farmers and unions to establish a thrust worthy relationship that can solve the problem sustainably. Ethiopia's oilseed sector plays an important role in generating foreign exchange earnings and supporting the livelihoods of market actors across the value chain.

### Agricultural Market

Agricultural markets are grouped into formal and informal markets. Informal market outlets concern the flow of agricultural products directly from the farm to the consumer through farm gate sales, roadside sales, etc. This kind of market is distinguished by unofficial trade agreements, seasonality and information asymmetry due to lack of market information. Conversely, formal markets involve various economic agents coordinated through formal linkage relationships. This is attributed to the cost embedded in the specified product and market standards to which collective action among farmers is suggested as a cogent solution.

Physical agricultural markets play a vital role in the transfer of agricultural product to consumers on time and where demanded. Which allows farmers to limit the cost and time spent for the product search. Contrary, virtual market outlets create the problem of market information asymmetry that deprive farmers of market information that is imperative for price setting. This imposes loss in bargaining power, which forces farmers to accept lower market prices. Lack of market organization and information has propagated power asymmetry that forces smallholder farmers to accept least prices. This has induced market failure that undermines the potential of agricultural markets in addressing food security and poverty alleviation.

A market channel is a set of interdependent economic agents that ensures the availability of products for consumption. Longer market outlets have been found to add more margins thus apportioning small end-product value to farmers. In contrast, shorter market channels eliminate middlemen intermediaries, allocating high producers' share to farmers. This is fundamental in the improvement of rural livelihoods through increased farmers' income.

Short channels, often called direct markets, also allow for farmer-consumer interactions for the advancement of customer satisfaction through the provision of high-quality products. Hence, short market outlet channels are often popular than longer formal outlets in agricultural marketing. This is therefore, marketing channel preference is one of the most important producers' decisions to sell their product in different marketing outlets and has a great impact on household income [3].

### Marketing Channel Choice

Marketing channel is downstream part of the value chain consisted of numerous chain actors at different outlets, where final products are available to final consumers. Channel is set of interdependent organizations involved in the flow of

products from producer to consumers and the flow of information on the other direction. A marketing channel performs the work of moving goods from producers to consumers, overcoming the time, place and possession gaps that separate goods and services from those who need. These market channels offer different prices and sales services, which determine farmers' choices of the channel and impact on farmer income and welfare outcome [4].

### Factors Affecting Marketing Channel Choices

Regarding factors affecting channel choices of the farmers, different researchers used multinomial logit and probit for categorical marketing system for different agricultural products. Using farm-level data investigates factors associated with the choice of three direct marketing strategies, direct-to-consumer outlet, intermediated retail outlet and sales to both outlets. They apply a selectivity-based approach for the multinomial logit model to assess the relationship between the choices of direct sales marketing strategy on the financial performance of the business.

Bongiwe and Masuku identified that age of the farmer, quantity of baby corn produced and level of education were significant predictors of the choice to sell vegetables. The age of the farmer, distance from production area to market, membership in farmer organization and marketing agreement were significant determinants of the choice to use non-wholesale market channel over other wholesale market channel. The study uses descriptive and multinomial logistic regression analyses to investigate factors that influence market channel choices.

Mamo and Degnet identified that gender and educational status of the farmer head together with farmer access to free aid, agricultural extension services, market information, non-farm income, adoption of modern livestock inputs, volume of sales and time spent to reach the market have statistically significant effect on choice of a market channel. The study uses binary logit and multinomial logit to explore the patterns and determinants of smallholder livestock farmer's market participation and market channel choice using a micro-level survey data from Ethiopia [5].

A study by Ferto and Szabo identified variables influencing producers' decision for channel choices. Multinomial logit model estimates, farmer's decisions with respects to supply channels differently by transaction costs and producers sell to wholesale market strongly and negatively affected by the farmer's age, information costs and negatively by the bargain power and monitoring costs.

According to Addisu et al., the multivariate probit model result indicated that farmer head educational level, farmer's family size, number of livestock owned, back animals owned, land area owned, distance to the nearest market and current market prices of tef significantly influenced Tef producers' choice of alternative market outlets.

Jari and Fraser identified that market information, expertise on grades and standards, contractual agreements, social capital, market infrastructure, group participation and

tradition significantly influence farmer behavior in marketing outlet choice. The study used multinomial regression model to investigate the factors that influence marketing choices among smallholder and emerging farmers.

### Description of the Data

Cross sectional data was taken for this study. The data was collected for assessing edible oilseeds potential to establish edible oil factories at Bokoji town from three kebeles of the district. The data (information on value chain analysis) was collected from 184 farmers of three kebeles. The data taken was edited, adjusted and sorted out accordingly for the current analysis *i.e.*, edible oilseeds market outlet choices by small holder farmers. From the collected data only market outlet choice variables are taken for the analysis. Thus, as independent variables, the demographic and socio-economic variables are considered as the determinant factors for market outlet choice [6].

### Method of Data Analysis

Farmers' choice decision analysis is founded on the rational choice theory in the free market conditions in agricultural marketing, that individual farmers choose a market alternative that maximizes utility from a set of mutually exclusive market outlet choices. The farmer's choice can be expressed using the random utility model for discrete choice decisions. A farmer with unique characteristics allocates average utility to the market outlet of choice, within the set of choices outlets. Under this circumstances producer choose different market outlet to maximize their utility, which is the maximum profit among the mutually exclusive choice and are more likely to choose two or more market outlets simultaneously. To accommodate the producer's different market outlet choice a Random Utility Model (RUM) was used. Random utility model is an indirect utility function where an individual with specific characteristics associates an average utility level with each alternative market outlet choice in a choice set. Subsequently, the producer's decision to sell in a given market is derived from the maximization of utility expected from these markets [7].

The small holder farmers choice among the market choice are not mutually exclusive as producers could sell at more than one market outlet at the same time and the random error terms of the market outlets may be correlated. Hence, multivariate probit model simultaneously captures the influence of explanatory variable on each set of market outlets and allowing for the potential correlation among unobserved disturbances as well as the relationship between the choices of different market outlets. Farmers make the choice of an appropriate market by comparing the expected utility (profit) of market outlets. Market outlet choice with the highest possible expected utility (profit) will be selected by producers. The expected utility difference can state as follows:

$$U_j = \pi_{ij}^A - \pi_{ij}^0 = X_a^A \beta_a + \varepsilon^A$$

Where;

$U_j$  represents the expected utility difference between the utility derived from market  $i$  selected by farmer  $j$  ( $\pi_{ij}^A$ ) and the utility of market  $i$  if not selected ( $\pi_{ij}^0$ ).

$A$  are the vectors of estimators and error terms, respectively.

$\beta_\alpha$  is a vector of estimators and  $\varepsilon^A$  is a vector of error terms under the assumption of normal distribution.

$$Y_{ij}^A = \begin{cases} 1 \text{ if } [\pi_{ij}^A - \pi_{ij}^0] \geq 0 \leftrightarrow X_\alpha^A \beta_\alpha \geq -\varepsilon^A \\ 0 \text{ if } [\pi_{ij}^A - \pi_{ij}^0] < 0 \leftrightarrow X_\alpha^A \beta_\alpha < -\varepsilon^A \end{cases}$$

Where:  $Y_{ij}^A$  is a dummy variable which represents the market selection  $i$  by producer  $j$ .

$$Y_{ij}^A = \begin{cases} 1 \text{ if } Y_{ij}^A = X_{ij}^A \alpha_{ij} + \varepsilon^A \geq 0 \leftrightarrow X_{ij}^A \alpha_{ij} \geq -\varepsilon^A \\ 0 \text{ if } Y_{ij}^A = X_{ij}^A \alpha_{ij} + \varepsilon^A < 0 \leftrightarrow X_{ij}^A \alpha_{ij} < -\varepsilon^A \end{cases}$$

Where  $Y_{ij}^A$  and  $X_{ij}^A$  represent the dependent and vectors of explanatory variables of the selection equation.

### Variables and Working Hypothesis

**Dependent variables:** Market Outlet Choices (MOC) is a dependent variable and it is measured by the probability of selling edible oilseeds to either of the market outlets. The market outlet choices might be along farmer's decision involving more than two markets outlets choices. Producers are expected to choose the best market outlets through which they choose to sell their products depending on various criteria. Smallholder farmers depending on their farming and socio-economic characteristics will choose market outlets that maximize their utilities (*i.e.*, profit). Farmgate, retailers and wholesaler market outlets are considered as market outlets choice [8].

**Farm gates (Local collectors):** Assemblers play an important role in collecting produce from smallholder farmers at the farm gates and delivering to either to whole sellers or consumers at district market. They are the first actor that links farmers to other actors. Local collector's purchases edible oilseeds from farmers at village/farm gates resell to district market for consumers or whole sellers by earning profits through adding value by transporting, storing and cleaning. Local collectors resell it only within district market.

**Retailers/Local market:** These are market actors operating at the last stage of the marketing channels selling to consumers. They buy farmers in their surroundings and directly resell to consumers or to the whole sellers. They perform several value addition activities such as buying, transporting, storing and selling to whole sellers or to end users. Value chain actors that buy produce directly from farmers than other actors and not resell for whole sellers or to consumers [9].

**Wholesalers:** These are those participants of the marketing system who used to buy at district market with a larger volume than other actors. Wholesalers buy mainly from individual farmers, some collectors/small traders and a few

other wholesalers within a district. They purchase this product only from actors within the district and resell within and outside the district main market. Within a district they resell to consumers. They add value by cleaning, loading/unloading, transporting by vehicles, reselling to outside markets. These actors play major role to move the product from one district or to others.

**Independent variables:** There are various factors affecting producers' choice of market outlet, choosing the appropriate market outlet to deliver farm products is not an easy decision for small holder farmers. Thus; variables of interest were selected based on the theoretical and the empirical studies conducted to identify determinants of market outlet choices. These factors are affecting the producer's choice of market outlet. The independent variables considered for this study are the following.

**Age of household heads:** It is continuous explanatory variable measured in years. Older people expected to have accumulated more knowledge than younger ones on marketing trends and opportunities and are more likely to sell through closer markets outlets. It is expected to have a positive or negative effect on farmer's choice of a marketing channel for utility maximizations.

**Sex of the household head:** Sex of the household head is a dummy independent variable that takes the value 1 if a member is male and 0 if female. Both men and women participate in selling using different channels to generate income that maximize their utility but male household heads have been reported to have a better tendency in searching market alternative for the sale of farm products than female household heads. Male household heads found to have a better tendency in searching market outlets for their potatoes compared to their female counterparts in Ethiopia. As a result, male household heads have more chance to choose channels than female household heads. It is expected to have a positive or negative effect on farmer's choice of a marketing channel.

**Education level of household head:** Educational level of household head is a categorical variable and measured by schooling year. It is believed that if a farmer attained formal education of any level there is a possibility that the farmer would choose appropriate market outlets. It is hypothesized to have positively related with market choice. According to Girma and Abebaw years of formal education linked to the critical thinking capacity of the farmer where he makes critical decisions to sell at the highest price. A positive sign hypothesized educated farmers being more likely to sell to more complex marketing channels.

**Access to agricultural extension services:** It is categorical variable, which describes the contact number of household head with the extension agents. Agricultural extension service expected to enhance households' skills and knowledge, link households with technology and markets. Extension service expected to have positive effect on the market outlet choices. The study made by Girma and Abebaw also supports the

relationship between extension contact and choice of channels.

**Access to market information:** This is dummy variable assigned 1 if the farmer has access to market information and 0 otherwise. The market information hypothesized to have a positive relationship with farmers' choice of marketing outlets choices. The better information that the farmers have about the product market, the better would be the choice he/she makes on the channel choices [10].

**Distance from market center:** It refers to the time taken between farm gates to the main market outlets. It is continuing variable which is measured in hour. The distances from the market influence households in buying inputs and selling outputs. The closer the market place to farm gate, the lesser would be the transportation costs, time, etc. Distance from the market center increase transportation and other marketing costs. The distance to market and choice of channels has a direct relations ship. It expected to have a negative effect on farmer's choice of a marketing channel.

**Membership to cooperative:** It is a dummy variable that takes 1 if the household is member of cooperative and 0 otherwise. It hypothesized to have a positive relationship between selling in a cooperative and choice of marketing channel. Zivenge and Karavina and Kuma, et al. indicated the positive relationship between members of cooperative and channel choice. Therefore, membership to cooperative hypothesized to influence channel choices of the households positively.

**Household head farming experience:** It is a continuous variable and measured in years. It is the total number of years a farmer stays in production. A household with better experience in edible oilseeds farming expected to produce more amounts of edible oilseeds and as a result, he expected to supply more amounts of edible oilseeds to the main market outlets. Farmers with longer farming experience expected to be more knowledgeable and skillful. Therefore, this variable is hypothesized to positively influence edible oilseeds market choice outlets.

**Family size:** It is a continuous variable measured in number. Availability of producing labor force in a household is assumed to affect farmers' market outlet decision. Households who have active labor expected to choose better market outlet than others do. As the active labor, force of the family increases the production that surplus to the market also increase. Hence, family size hypothesized positively to affect market outlet choices.

**Access to credit:** This is dummy variable taking value of 1 if farmers take loan and 0 otherwise. Access to credit would enhance the financial capacity of the farmer to purchase the

inputs, thereby increasing production and push farmers to sell at different market outlet. Therefore, it is hypothesized that access to credit would have positive influence on level of production and sales [11].

**Total livestock holding:** This is a continuous explanatory variable measured in tropical livestock unit. Farmers who owned and specialize in livestock assumed to affect farmers decision in choice of market outlet. Study by Rehima on pepper marketing showed that, total livestock holding showed a negative sign on quantity of pepper sales. But under this study; total livestock holding is expected to have positive effect on market outlet choice.

**Land size allocated for edible oilseeds productions:** It is continuous variable measured in hectare. Area allocated for edible oilseeds productions hypothesized to influence market outlet choice positively. Masuku, et al., in their study to identify factors influencing the choice of marketing channel by maize smallholder farmers in Swaziland found that farm size has positive effect on the decision to sell maize through formal channel.

**Farm yield (productivity):** It is a continuous variable measured in quintals in quintals; which is directly contributes the market outlets choice. Farmers who produce more yields are expected to supply more and choice market channels to the market than those who produce less. Therefore, the variable is hypothesized to affect channel choice positively.

## RESULTS AND DISCUSSION

### Demographic and Socio-Economic Characteristics of the Households

Demographic characteristics of the respondents are analyzed using mean, maximum, minimum, frequency and percentages. Table 1 indicate that the general characteristics of small holder's edible oil producers, out of total 184 respondents, 142 (77.17%) were male-headed and the rest of 22.83% were female-headed small holder farmers and of this 54.89% the small holder farmers were a cooperative member where as 45.11% of were none members of cooperatives. Of these respondents 77.72% and 61.41% of the small holders have access to market information's and credits respectively. These implies that, majority of the farmers are male headed, cooperative members and have access to credit and market information's (Table 1) [12].

**Table 1:** General characteristics of sample producers (dummy variables).

Variables		Frequency	Percent
Sex of household head	Female	42	22.83
	Male	142	77.17

Cooperative membership	None	83	45.11
	Member	101	54.89
Market information	No access	41	22.28
	Access	143	77.72
Access to credit	No access	71	38.59
	Access	113	61.41

Table 2 to indicate that, an average household size of sample respondents was 4.679 with standard deviation of 1.422. Educational background of the respondent's household heads was an average number of was 5.67 years completed with a standard deviation of 4.13 and the average age of the household head was 39.848 years with 8.683 standard deviation. The average farming experience of respondents of an individual continuously engaged in was 16.5 years with standard deviation of 6.80. The average frequency of agricultural extension service provided for sampled households was 2.989 days/year with standard deviation of

1.008 (Table 2). The average distance from farmer home to the main market place where produce of the farmers sold was an average of 16.679 kilometers with standard deviations of 4.435. The average land allocated for edible oilseeds in hectares and its productions in quintal's were 1.60 and 8.521 with standard deviations 0.951 and 4.664 respectively. Table 2 also shows that the average livestock ownership was 3.369 with standard deviation of 1.207.

**Table 2:** General characteristics of edible oilseeds producers.

Variables	Obs	Mean	Std. dev.	Min	Max
Age	184	39.84783	8.682543	25	67
Experience	184	16.5	6.800836	5	35
Family size	184	4.679348	1.422077	2	9
Land allocated	184	1.600543	0.951387	0.25	5
Livestock	184	3.369565	1.207602	2	6
Education	184	5.668478	4.126932	1	41
Distance from main market	184	16.67935	4.435378	10	35
Oilseed produced in QNT	184	8.521739	4.664664	3	30
Extension service	184	2.98913	1.008104	1	6

### Determinants of Market Outlet Choices

Multivariate probit was employed to analyze factors affecting edible oil seeds market outlet choice decision of smallholder producer. Thirteen explanatory variables hypothesized that affect edible oilseeds market outlet choice of producer were age of the household head, sex of the household head, education level of household head, access to agricultural extensions services, access to market information, distance from the main market, memberships to cooperatives, farming experience in edible oilseeds production, producing family size, access to credit, total livestock holding, land size allocated and farm yield was analyzed by multivariate probit model.

Table 3 summarizes the model results of different demographic, socio-economic and institutional factors

affecting the decision of the producers to choose an appropriate market outlet for their produce. The model fits the data reasonably because of Wald test (Wald  $\chi^2$  (36)=51.70,  $p=0.0436$ ) is significant at 5% level, which indicates that the subset of coefficients of the model is jointly significant and that the explanatory power of the factors included in the model is satisfactory. The likelihood ratio test was used to test the null hypothesis that the market outlet choices are independent. The result of tests for the independence of market outlet choices ( $p_{21}=p_{23}=p_{31}$ ) was obtained significant at a 1 percent significance level. This suggests that the decision of the producers to choose market outlets is interdependent with each other. Consequently, the model estimation ignoring this interdependency will result in biased estimates. Multivariate probit model taking into

account this interdependence was used to determine factors affecting market outlet choices (Table 3).

**Household head age:** The analysis result reveals that farmers age influenced the likelihood of choosing farm gates market outlet significant at 5% level and the likelihood of choosing wholesaler market outlet is negatively significant at 10% significance level. The negative coefficient implies as the age of farmers increase less likely associated with whole sale market outlets. This implies the small holder farmer most likely tends to choose the farm gate or local collectors market outlets for their produce.

**Household heads sex:** The results of the analysis under Table 3 indicated that gender influenced the choice of wholesale market outlets negatively at 5% significance level. This implies that females prefer selling their edible oilseeds in the farm gates market than their male counterparts. This has an important policy implication in that increasing the participation of females in the whole market could decrease the income inequality between males and females. Hence, the promotion of marketing in the main market will have a significant implication for the gender dimension problems (Table 3).

**Table 3:** Results of multivariate probit model.

Variables	Farmgate		Retailor/ Collectors		Wholesalers	
	Coef.	(Std. err.)	Coef.	(Std. err.)	Coef.	(Std. err.)
Farm experience	0.032	0.015	-0.029	0.019	-0.028	0.015
Sex	-0.526	0.255	-0.167	0.349	0.374	0.262
Family size	0.066	0.069	-0.154	0.098	-0.219	0.079
Cooperative membership	0.083	0.197	0.09	0.282	-0.247	0.218
Land allocations	-0.15	0.157	0.213	0.256	-0.32	0.188
Livestock ownership	0.095	0.085	-0.011	0.119	-0.069	0.094
Agri extension service	-0.078	0.101	0.015	0.135	0.093	0.107
Market information	0.113	0.247	0.02	0.33	0.142	0.271
Distance from main market	0.007	0.021	0.036	0.035	0.023	0.027
Education	0.031	0.029	0.098	0.05	0.021	0.026
Oilseed produced/year	-0.016	0.032	-0.042	0.049	0.136	0.047
Access to credit	-0.38	0.206	0.18	0.293	0.588	0.227
_cons	-0.248	0.732	1.443	1.046	0.349	0.83
Log likelihood=-257.2 7676						
Number of obs=184						
Wald chi <sup>2</sup> (36)=51.70						
Prob>chi <sup>2</sup> =0.0436						

**Access to credit:** This variable negatively influenced the likelihood of choosing farm gates market outlet at 10% significance level. This negative coefficient indicates that negative association between farmers and farm gates outlet because farm gates outlet pays lower price than other two

outlets choice. All farmers having access to credit didn't choose farm gates market outlet since it pays lower price for edible oilseeds. On the contrary, this variable is positively influenced the likelihood of choosing wholesale market outlet at 1% significance level. The negative coefficient indicates that



negative relations between farmers market outlets choice and farm gates. On the other hand, indicates that positive association between farmers market choice and wholesale, because whole sale market outlet choice pays the higher price for their farm produce. All farmers having access to credit chooses whole sale market out since it pays the highest price to their products [13].

**Educations level:** Education level influenced significantly the likelihood of choosing retail market outlet at 10% significance level. This implies the education levels increase farmers most likely tends to choose retail market outlets. The producers prefer selling at the retail markets outlets choice to minimize the transportation cost associated with the distance.

**Household family size:** This variable negatively influenced the likelihood of choosing wholesaler market outlet of producers at 1% significance level. Negative sign shows that household was negatively associated with choosing wholesalers market outlet.

**Land allocated:** The study result reveals that land size allocated for edible oilseeds influenced the likelihood of choosing whole sale market outlet positively at 10% significant level. The positive coefficient implies that farmers those who own large hectares of land were more likely associated with wholesale markets outlets choice because price paid by wholesale outlet was better than the farm gates and retail market consumer outlet. Also, it indicates that producers who owned large size of land more likely allocates large area of land for edible oil seeds cultivation and able to produce large quintals of which leads them to prefer wholesale market who purchase in large quintals rather than selling for retailer and farm gates.

**Farm yield (productivity):** This finding reveals that, quantity of sold positively influenced the likelihood of choosing wholesaler market outlet at 1% significance level. This implies that the larger quantity sold the more a farmer was likely to sell wholesaler. The positive coefficient implies that producer tend to increase association with wholesaler to sell their production. The other point with this finding reveals that farmer those supplies large quantity of edible uses selling for whole sales. This finding is consistent to Addisu which indicated that the likelihood of choosing wholesaler positively and significantly affected by volume supply to market [14].

## CONCLUSION

The production and marketing of edible oilseeds contribute significantly to the well-being of the smallholder producers. However, production and marketing of edible oilseeds were constrained by different marketing problems. Smallholders' decision to choose appropriate market outlet choice is an important farm household specific decision. However, the smallholders' decision to sell their products in a different market outlet choice is made by evaluating the expected benefits of each market outlet, where by the choice among the market alternatives is not mutually exclusive as producers could sell at more than one market outlet. Hence, a

multivariate probit model was adopted to examine factors that affect market outlet choices.

The results of the study indicated that the decision of the producers to choose appropriate market outlets for their product is determined by different demographic, socio-economic and institutional factors. Accordingly, the household head age influenced the decision of the producers in farm gates and whole sale market outlets choice. Though the direction of the effect varies between different market outlets, it was obtained as an important determinant influencing the decision of households choosing an appropriate market outlet. This implies the smallholder producers age has a significant effect on the choice of the market outlets. The other important determinants of the market outlet choice are sex of the household which negatively affects the wholesale market outlets choice. This implies that females prefer selling their edible oilseeds in the farm gates market than their male counterparts.

Access to credit was obtained positively and significantly influencing the decision to choose the wholesale market outlet and negatively influencing the decision to choose farm gates outlets. Households who have access to credit services selected the wholesale market outlet to sell their products. This implied that the credit access should be accessible to the smallholders to help them to choose the appropriate market outlets. Other important factors influencing the market outlets choice is educations level. Small holder farmers are choosing retail market outlet as their level of educations increase. This implies as the education levels increase farmers most likely tends to choose retail market outlets, since they compare the different market choice outlet benefit. Family size of the producer negatively influenced the likelihood of choosing wholesaler market outlet. Land allocated and farm yield (productivity) are the other important determinant factors for small holder farmers to market outlets choice. The study result reveals that land size influenced the whole sale market outlet. Farmers those who own large hectares of land were more likely associated with wholesale markets outlets and the larger the larger quantity sold the more a farmer was likely to sell wholesaler at the whole market outlets and farmer those produced large amount of quantity of edible oil seeds uses selling for whole sales. Hence, the smallholder farmers should be strengthened to enable to choose an appropriate market outlet choice generate the better benefit and to improve livelihood of smallholders from producing and marketing of edible oilseeds.

## REFERENCES

1. Abebe NT (2016) Review of sesame value chain in Ethiopia. *Int J Afr Asian Stud.* 19: 36-47.
2. Degefa K, Biru G, Abebe G (2022) Determinants of market outlet choices of TEF producers in western Ethiopia: Evidence of multivariate probit model. *Turkish J Agri Food Sci Tech.* 10(8):1496-1505.

3. Amentae TK (2016) Evaluation of supply chains and post-harvest losses of selected food commodities in Ethiopia. *Depart Eng Tech Swedish Uni Agri Sci*.
4. Arinloye DDA, Pascucci S, Linnemann AR, Coulibaly ON, Hagelaar G (2015) Marketing channel selection by smallholder farmers. *J Food Product Market*. 21(4): 337-357.
5. Barrett CB, Reardon T, Swinnen J, Zilberman D (2022) Agri-food value chain revolutions in low-and middle-income countries. *J Eco Literat*. 60(4):1316-1377.
6. Blandon J, Henson S, Islam T (2009) Marketing preferences of small-scale farmers in the context of new agrifood systems: A stated choice model. *Agri Int J*. 25(2): 251-267.
7. Dendena B, Corsi S (2014) Cashew from seed to market: A review. *Agron Sust Develop*. 34:753-772.
8. Dessie AB, Abate TM, Mekie TM (2018) Factors affecting market outlet choice of wheat producers in North Gondar zone, Ethiopia. *Agri Food Sec*. 7:1-8.
9. Diriba G (2018) Agricultural and rural transformation in Ethiopia. *Ethiopian J Econ*. 27(2): 51-110.
10. Dlamini SI, Huang WC (2020) Analysis of market outlet choice by smallholder beef cattle farmers in Eswatini. *J Econ Sus Dev*. 11:22-34.
11. Emanu B, Ketema M, Mutimba JK, Yousuf J (2015) Factors affecting market outlet choice of potato producers in Eastern Hararghe Zone, Ethiopia. *J Eco Sustain Develop*. 6(15):159-172.
12. Gashaw BA, Kibret SM (2018) The role of Ethiopian Commodity Exchange (ECX) in crop value chain development in Ethiopia. *Int J Bus Econ Res*. 7:183.
13. Gebretsadik D, Haji J, Tegegne B (2019) Sesame post-harvest loss from small-scale producers in Kafta Humera district, Ethiopia. *J Develop Agri Econ*. 11(2):33-42.
14. Gramzow A, Batt PJ, Afari-Sefa V, Petrick M, Roothaert R (2018) Linking smallholder vegetable producers to markets-A comparison of a vegetable producer group and a contract-farming arrangement in the Lushoto district of Tanzania. *J Rural Stud*. 63:168-179.