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Analysis of Determinants of Sesame Marketed Surplus. The Case of Gida Ayana Districts, Western Oromia, Ethiopia

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Abstract
A higher marketed surplus would help farmers to participate in a high value markets by increasing their level of income which in turn contribute to the economic development and poverty alleviation. The objective of this paper is to estimate the marketed surplus of sesame by smallholders and to identify its underlying determinants. A two-stage random sampling procedure was employed and a total of 122 smallholder farmers from four kebeles were randomly and proportionately sampled to collect both secondary and primary sources. The results of econometric analysis showed that sesame marketed surplus was significantly affected by education of the household head, farming experience, yield, frequency of extension contact, land allocated to sesame production, access to market information, and distance from the market The findings of the study suggest that strengthening the provision of formal and informal education, improving farmers' access to improved and disease resistance seed variety, improving and strengthening institutional services, intensifying inputs on the land allocated to sesame production, and providing adequate updated market information are required.
Key words: - Marketed surplus, Sesame, Multiple linear regression
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1. Introduction

Agriculture accounts for about 41 percent of gross domestic product (GDP), about 90 percent of export value and directly supports 80 percent of the populations` livelihoods (MoFED, 2015). The sector is dominated by over 15 million smallholders producing about 95 percent of the national agricultural production (CSA, 2016). Within Ethiopian agriculture, oilseeds are the most important export crop in terms of volume and value. It plays significant role on the lives of the Ethiopian agrarian community and stakeholders in the national economy in Ethiopia (Wijnands *et al.,* 2009). The oilseed sector in Ethiopia is one of the fastest growing sectors in the country. It is the second largest source of foreign exchange earnings after coffee (Food and Agriculture Organization, 2012; Abadi, 2018). Increasingly, sesame seed is taking a significant role in the oilseeds sector over the past years and has become the most relevant commodity. Its demand at the global and local level has been growing. Overall, contribution from the sector to the national economy in terms of employment, income, and foreign exchange generation will be high in the future (FAO, 2015). Sesame is mainly produced for the market and it is demanded for its seed and for the oil in the seed.

Ethiopia produces high quality sesame seed varieties that are suitable for a wide range of applications. Humera, Gondar, and Wollega type sesame seeds are among the different varieties of sesame seeds produced in Ethiopia that are well known in the world market. (Geerts *et al.,* 2015*).* Ethiopian sesame seed market covers quiet a wide range of countries all over the world. The growing demand in the world market and the available capacity to expand sesame production is the main device for the growing trends in volume of production, which could contribute to the economic growth at national, regional, and family levels (FAO 2015). Although sesame is produced in many parts of Ethiopia most of the marketed sesame comes from the regions of Tigrai, Oromia and Amhara Regional State. The three regions contribute for about 95 % of the total sesame production and the remaining 5% comes from Benishangul Gumuz regional states. East Wollega zone is one of the sesame growing zones in Oromia Regional State covering a considerable export share of the country (CSA 2018).

To meet the growing demand of sesame, the country is heavily dependent on the availability of adequate local supplies. In order to expand the leading role agriculture plays in economic growth and poverty reduction, smallholder farmers need to improve their marketed surplus. A higher marketed surplus would help farmers to participate in a high value markets by increasing their level of income. Despite the importance of sesame for better income generation, smallholder farmers in the area continue to face numbers of challenges related with marketing. Though some farmers are continuously encouraged to increase supply of sesame into the market, the low price offer forced farmers to hoard their products waiting for better price. Limited access to market facilities, less exposure for market information, infrastructural problem, inadequate support services, poor market infrastructure, absence of adequate road network, limited access to extension services and problem in transportation services are some of the problems resulting in low participation of smallholder farmers in selling their products. More importantly marketed surplus of sesame in the study area is subjected to seasonal variation where surplus supply at the harvest time is the main feature (preliminary information). Therefore, understanding the behaviour of

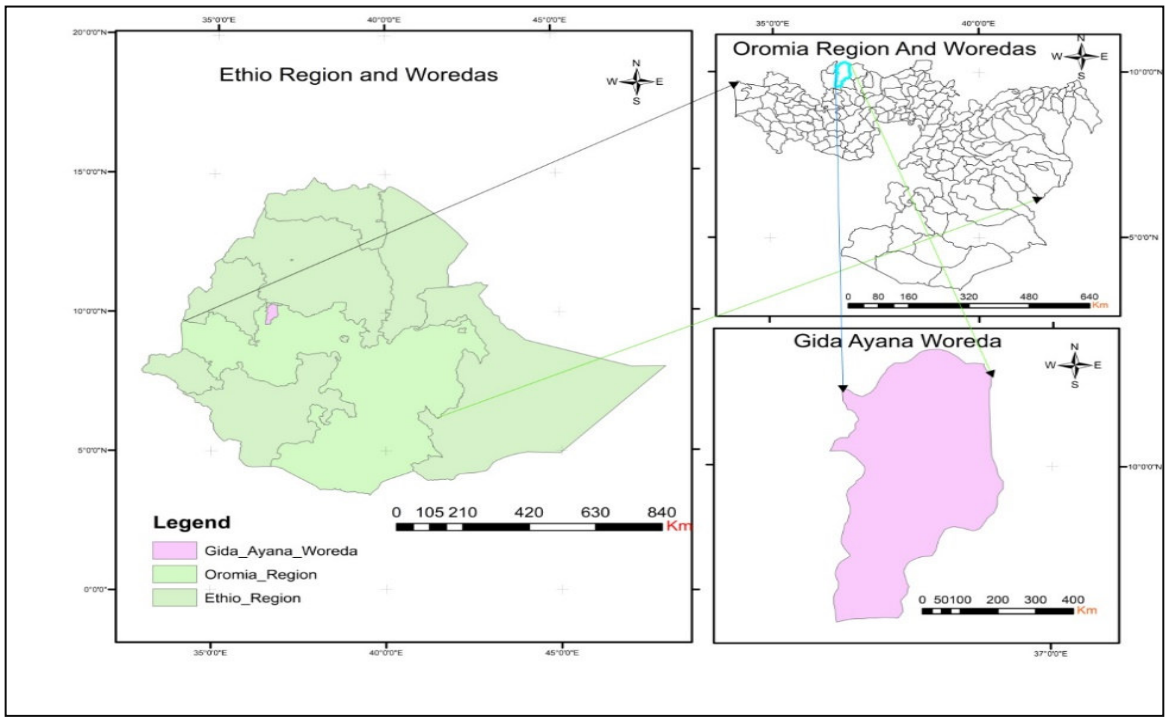
marketed surplus of sesame and the variables affecting it can be of great importance in the development of sound policies with respect to agricultural marketing and prices, imports and exports, and overall rural and national development objectives of the country. Hence, it was important to analyze determinants of marketed surplus of sesame and point out potential factors policy should focus in the area.

2. Research Methodology

2.1 Description of the study Area

This study was conducted in Gida Ayana district found in East Wollega zone of Oromia Natioal Regional State. It is located about 440 and 115 km away from Addis Ababa (capital city of Ethiopia), and Nekemte (the zonal capital of East Wollega), respectively. It is, one of the 17 districts of East Wollega Zone, geographically located at 09^0 30' 30" N; 036^0 29' 28" E. It is bordered by Guto-Gida and Sibu Sire districts in the South, Ebantu and Limu district in the West, Beneshngul Gumuz Regional State in the North, and Kiremu and Abe Dongoro in the East. Gida Ayana district is composed of 22 rural *kebeles* and 6 urban *kebeles* (GAoANRM, 2019). Gida Ayana district has area coverage of 183,063.73 hectares of land out of which 65% is arable land, 12.9% rangeland, 19.5% forest, irrigated and wetland 1.2% and the remaining 3.4% is considered unusable. The district lies between two ecological zones mid altitude 52 % and low land 48 %. The mean annual rainfall is estimated at about 1,600 mm (ranging from 1000 to 2000) (GAoANRM, 2019).

Figure 1. Location map of Gida Ayana district



Source: Adapted from Ethiomap-GIS

According to GAoANRM (2019), the livelihoods of the farmers are based on mixed farming occupational activities. They derive their livelihood by animal rearing and crop cultivation. The contribution of crop production for rural livelihood accounts for 70% and livestock production take the share of 30% of rural farm income in the study area. The main crops growing in the area are cereals, pulses, oil seed crops, and different types of horticultural crops: from the cereal crops, maize, wheat, finger millet; from oil seed crops, noug, (niger seed), sesame, groundnut, soya bean; from horticultural crops, green pepper, tomato, red onion, cabbage and carrot are the major horticultural crops grown in the area. Sesame is the major cash crop in the lowlands followed by livestock and maize productions. (GAoLFA, 2019). Data from Central Statistical Agency indicates that the total population of the district is estimated to be about 142,408 out of which 66,918 (47%) are female and 75,490 (53%) male. (CSA, 2015)

2.2. Types and Sources of Data and Methods of Data Collection

Both primary and secondary data were used to conduct this study. Primary data were collected from sesame producers by using semi-structured questionnaire. Questionnaire was prepared and pre-tested before the execution of the survey. A checklist was also used to guide the informal discussion conducted to generate data that can substantiate information from individual interviews. Participatory data collection tools like group discussions and

key informant interview was utilized for data collection process. Enumerators, who have acquaintance with the local language and the culture of the local people were selected, trained, and employed for data collection. Secondary data was collected from different sources such as from government institutions available in the district, Ethiopian Commodity Exchange Authority, and non-governmental organizations operating in the study area. Discussion was made with the important and concerned experts and other officials to pursue additional information and/or cross check the data.

2.3 Sampling Method and Sample Size

In order to select a representative sample that represent the population, a two-stage sampling technique was used. In the first stage, out of twelve sesame producing *kebeles* in the district, four *kebeles* were randomly elected. In the second stage, using the population list of the sample *kebeles*, 122 sesame producer households were selected randomly using probability proportional to number of sesame producer households from each sample *kebeles*. Sample size was determined following a simplified formula provided by Yamane (1967).

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

Where:

n=is the sample size(122), N = total number of sesame producer households (12564), and e = is the level of precision (9%).

Table 14. Distribution of household in selected *kebeles*

No	*Kebeles*	Total number of sesame producers in each selected *kebeles*	Number of sampled households in each *kebeles*
1	Tulu Lencha	983	29
2	Delesa Mekanisa	942	27
3	Andode Dicho	1254	36
4	Warabbo	1017	30
	Total	**4196**	**122**

Source: Gida Ayana district Bureau of Agriculture and own computation, 2019

2.4. Methods of Data Analysis

Descriptive statistics like means, frequencies, percentages, maximum, minimum, and range were used to describe the descriptive and multiple linear regression model was employed to analyze factors affecting marketed surplus. Model Specification: Market participation studies based up on dichotomous regression models have attempted to explain only the probability of participation versus non- participation rather than the extent and intensity of participation. A strictly dichotomous variable often is not sufficient for examining the extent and intensity of some problem such as market participation (Feder *et al.* 1985). Multiple linear regression model was applicable for marketed surplus analysis since all household farmers in this study sold sesame. However, when some of the assumptions of the Classical Linear Regression (CLR) model are violated, the parameter estimates of the above model may not be Best Linear Unbiased Estimator (BLUE). Thus, it is important to check the presence of heteroscedasticity, multicollinearity and endogeniety problem before fitting important variables into the regression model for analysis. Multicollinearity problem arises due to a linear relationship among independent variables; and becomes difficult to identify the separate effect of independent variables on the dependent variable because of the existence of strong relationship among them (Gujarati, 2004). Variance inflation factors (VIF) has been used to check existence of multicollinearity among independent variables included in the model. The results for all VIF values were ranging between 1.10 and 3.76 with mean value of 1.83. This indicates absence of multicollinearity problem among independent variables. Hetroscedasticity is a situation in which variance of the disturbance term is not constant. If there is heteroscedasticity problem in the data set, the parameter estimates of the coefficients of the independent variables cannot be BLUE. In this study, Breusch-Pagan test of heteroscedasticity was employed for detecting heteroscedasticity. Therefore, to overcome the problem Robust OLS analysis with heteroscedasticity consistent covariance matrix was estimated. The problem of omitted variable was tested using Ramsey RESET test. Since the p-value for this test is 0.2314, there is no omitted variable problem in our model. The source of endogeneity could be omitted variables, measurement error and simultaneity (Maddala, 2001). The problem of omitted variable was tested using Ramsey RESET test.

The Econometric model specification of marketed surplus function in matrix notation is $y_i = X`\beta + \varepsilon_i$, where; yi is quantity of sesame in kg marketed, X ' is vector of explanatory variables, β is a vector of parameters to be estimated, and εi is disturbance (error) term. Sesame marketed surplus is a continuous dependent variable used in the multiple linear regression model. It is measured by the total quantity of sesame in quintal marketed by individual smallholder farmer in 2017/2018 fiscal year, whereas the summary of independent variables used in this model are presented below in Table 2.

Table 2. Description of explanatory variables used in the multiple linear regression model

Variable	Measurement	Expected outcome
Education of the household (EDU)	Continuous(yrs of schooling)	+
Household family size (FAMSIZE)	Continuous(man equivalent)	+
Oxen Ownership (OXENO)	Continuous(Number)	+
Sesame farming experience(EXPR)	Continuous(Number)	+
Yield(YIELD)	Continuous(qt/ha	+
Extension contact frequency (EXTC)	Continuous(number of days)	+
credit (ACCREDIT)	Dummy(1= yes,0=otherwise)	+
Land allotted to sesame (SELAND)	Continuous(hectare)	+
Access to market information(ACCMIF)	Dummy(1=yes, 0 otherwise)	+
Livestock (TLU)	Continuous(TLU)	-
Membership to cooperative (COOPMEM)	Dummy(1=yes, 0= otherwise)	+
Distance from market center(DFRMKT)	Continuous(Kilometers)	-
Off/nonfarm income(offincome)	Continuous(birr)	-/+

Source: Own Computation

3. Results and Discussions

3.1. Demographic and Socio-economic Characteristics

The total size of the sample was 122. As shown in table 3, the results of the study revealed that out of the total households interviewed, 85.25% were male-headed household, while 14.75 % were female-headed households. The average age of household heads was 43.38 years. Out of the total, the number of, married, single, divorced, and widowed households during the survey period was 90.98%, 4.92%, 1.64%, and 2.46% respectively.

The average family size of the sample households was found to be 4.70 ranged from 1 to 13. It is clear that education can influence productivity of producers and adoption of newly introduced technologies and innovations. Hence, literate producers are expected to be in a better position to get and use information, which contributes to improve their farming and marketing practices. The average educational status of sample household was 4.02 with standard deviation of 2.87. The average sesame production experience was 10.55 years.

Total Land size and land use pattern: Resource like land is the most important factor, which affects the production of crop in general and sesame in particular. Land is one of the most productive assets of sample producers. The survey result revealed that the total average land size of sample producers was 3.33 ha and range from 0.5 to 15 hectares. In addition, from the total land holding, the average land allocated to the sesame production per sample producers was 1.92 hectares' ranges from 0.25 ha to 5.5 hectares and the standard deviation from the mean was 1.09 hectares during the surveying year.

Livestock Ownership: Livestock are an important component of the farming system practiced by the farmers, and it is an important asset for rural households in Gida Ayana districts and serves multiple purposes. The mean total livestock owned of the total sample sesame producers was found to be 7.17 and ranged from 2.25 to 42.75 with a standard deviation of 7.25. Farmers in the study area use oxen to undertake different agronomic practices, out of which plough and threshing were the major once. Conventionally, land preparation is done using a pair of oxen; as a result, 33.7% of the sample households could not independently plough their farm using own oxen. Hence as an alternative, they will go for oxen exchange arrangements or rent-in from others.

Table 3. Demographic and socio-economic characteristics

Variable	Category	N	Percentage (%)	
Sex	Male	104	85.25	
	Female	18	14.75	
Marital statues	Married	111	90.98	
	Single	6	4.92	
	Divorced	2	1.64	
	Widowed	3	2.46	
	Mean	**Std. dev**	**Min**	**Max**
Age (year)	43.37	11.22	20	71
Family size (Man equivalent)	4.70	1.86	1	13
Education status(year)	4.02	2.87	0	12
Sesame Production experience (year)	10.55	5.15	2	27
Land allotted to sesame(hectares)	1.92	1.09	.25	5.5
Livestock owned(TLU)	7.17	7.25	2.25	42.75
Off/non-farm income(Birr)	1579.95	2033.29	0	11000

Source: Own computation from the survey, 2019

Off/non-farm activities**:** Farmers in the study area were engaged in various off-farm activities other than the main farming activities during the farming season. This may be due to the meager returns they obtain from the agricultural activities. The off-farm activities in which the farmers were engaged include selling local drink, butchery, handcrafts and retailer. The income they desperately need to obtain from such off-farm activities supplements the low income usually obtained from their farming, which is their main stay. About 66.67% of the sample farmers reported that they participated in different off-farm activities, while the remaining 33.33% responded that they did not participate in any off-farm activities. The mean cash income from off/non-farm income was about Birr 1579.95 with standard deviation of 2033.29.

3.2. Institutional Characteristics

Institutional support services are essential precondition for enhanced sesame market. More specifically, accesses to extension services, access to credit, access to market information, and access to cooperative services that would increase market surplus of producer.

Access to extension services: Access to extension services is expected to have direct influence on the production and marketing behavior of the farmers. The more contact a farmer has access to the extension service, the more likely that farmers adopt new farm technologies and innovations, which leads to better product quality. Extension service in Gida Ayana Woreda is fully provided by Woreda agricultural line departments. There are three Development Agents (DAs) assigned for each *kebele* in the Woreda. Three DAs institutionally assigned to work in crop production, animal science, and natural resources per *kebele*. According to the assessment, the extension visits in sesame production in the year 2016/17, about 46.72% of the respondents had no extension contact, while 7.38%, 12.30%, and 14.75%, 18.85%, of the respondents were entitled to get extension access at any time required, weekly, once in two weeks, and monthly basis, respectively. The assessment on extension services further highlighted that, learning and knowledge imparting need to be strengthened further in order to support households to benefit from the commodity. As per the survey result the frequency of extension visit and services provided for sesame is less as compared to cereals production. Therefore, it is important to evaluate whether the extension contact had significant effect in improving marketed surplus of sesame producer farmers in the study area.

Credit services: Farmers with access to credit may minimize the effect of financial constraints and able to buy the necessary inputs that improve their market supply more readily than those with no access to credit do. As depicted in table 4 below, out of total sample respondents`, about 62.30% had access to credit and 37.70% had not. For those who had the access, the source of credit was microfinance (Oromia credit and saving institution) 51.32%, bank 10.53%, traders 14.47%, relatives 15.79% and neighbors 7.89%. Particularly at harvesting time, traders lend loans to the producers and then secure their supply. The households use the credit to purchase inputs, for medication and fulfillment of other basic needs.

Table 4. Institutional characteristics

Variables	**Category**		**N**	**Percentage (%)**
Extension agent contact frequency	No contact		57	46.72
	Any time asked		9	7.38
	Weekly		15	12.30
	Once in two week		18	14.75
	Monthly		23	18.85
Access to credit	Yes		76	62.30
	No		46	37.70
Access to market information	Yes		77	63.11
	No		45	36.89
Cooperative membership	Yes		81	66.39
	No		41	33.61
	Mean	**Std. dev**	**Min**	Max
Distance from the main market	6.86	3.49	2	19

Source: computation from the survey, 2019

Access to market information and distance from the market: The function of market information in decision-making process is to reduce risks and uncertainties related to market and enables sesame producing farmer households to make the right decision in sales and price of the products produced and inputs used in the production process. As depicted in table 4 above, the survey result reveals that about 63.11% of the sample households had access to market information from different sources and 36.89 % of sampled household had no access to market information. For those who have market information, the type of market information provided were market place information (32.47%), price information (22.07%), buyers' information (12.99%), and both market place and prices information (23.38%), and market place, price and buyers information (9.09%) (Appendix table 5).The

result also revealed that from those who have access to market information, the major source of market information were traders (2.86%), radio/television(35.06%), friends/relatives(14.29%), and *woreda/ kebeles'* administrations (7.79%). Distance from households' house to primary market center was also the factor expected to determine households' market supply. As described in table 4, above the distance needed for households to travel to market center is 6.86-kilometer on average, which ranges from 2 kilometers to 19 kilometers.

Membership to cooperatives: **c**ooperatives improve understanding of members about market and strengthen the relationship among the members by providing different services for households. As depicted in table 4, of the total interviewed sample farm household 66.39% were members of farmer primary cooperatives, while 33.61% were not members of farmer primary cooperatives.

3.3. Econometric results

Determinants of marketed surplus: Thirteen explanatory variables were hypothesized to be determinant factors to affect marketed surplus of sesame. In this regard, the result of multiple linear regression models revealed that, of thirteen variables included in the model seven variables (education level of the household, sesame farming experience, yield, number of extension contact, the area of land allotted for sesame production, access to market information, and distance from the nearest market) were found to statistically and significantly affect the quantity of marketed surplus of sesame. (Table 5). The model was statistically significant at 1% probability level indicating the goodness fit of the model to explain the relationships of the hypothesized variables. Coefficient of multiple determinations (R^2) was used to check goodness of fit for the regression model. Hence, R^2 indicates that 91 percent of the variation in the dependent variable was explained by the explanatory variables under consideration.

Table 5. OLS estimates of multiple linear regression model result

Variables	**Coef**	**Robust Std.Err**	**t-value**
Education	0.586***	0.184	3.19
Family size	0.142	0.115	1.24
Oxen number	-0.148	0.151	-0.98
Experiences	0.277**	0.139	2.00
Yield	0.592***	0.211	2.81
Number of extension contact	0.379*	0.219	1.73
Access to credit	-0.515	0.673	-0.77
Area land allotted to sesame	3.118***	0.704	4.43
Access to market information	0.882***	0.286	3.09
TLU	-0.050	0.069	-0.72
Cooperative membership	0.449	0.478	0.94
Distance from market center	-0.199***	0.084	-2.37
Off /non-farm income	0.001	0.002	0.20
_cons	-4.124	1.063	-3.88

***, ** and * represent significant at 1%, 5% and 10% probability levels, respectively

Source: Own computation from survey result, 2019

Education level of household head (EDU): It was hypothesized that and in line with the expectation, formal education has positive effect on the quantity of sesame marketed surplus positively and statistically significant at 1% significance level. The result indicated that one additional year of formal education level leads to an increase in the intensity of marketed surplus of sesame by 0.586 quintal. The positive and significant relationship may indicate that formal education determines the readiness to accept new ideas and innovations, and easy to get supply, demand and price information which enhances farmers' willingness to produce more and increase volume of sales. This result is consistent with Grover *et al.* (2012), and Zekarias *et al.* (2012) who found that level of education affected marketed surplus of wheat and rice, and coffee positively and significantly, respectively.

Sesame farming experience (EXPR): This variable affected marketed surplus significantly and positively at 5% level of significance. The coefficient for this variable implied that, as farmer's experience increased by a year, sesame marketed surplus increased by 0.277quintal. This is probably due to the reason that as farmers are experienced with sesame farming, they would be aware of the benefits of selling sesame than those famers with low farming experience. This result was in line with the studies by Addisu (2016), and Ayelech (2011), Bizualem *et al.* (2015), as farmers experience affected the amount of, avocado, and coffee, supplied to the market positively, respectively. Similarly, Ele *et al.* (2013), Jemal (2013), and Benjamin (2013) illustrated farmers' farming experience increased the volume of crops, coffee and groundnut supplied to the market, respectively.

Sesame yield (YIELD): Yield of sesame affected marketed surplus significantly and positively as expected at less than 1% significant level. Positive coefficient indicated that an increase in productivity of sesame increases marketed surplus of sesame. It indicated that households with high level productivity had also supplied more to the market than those who had low productivity of sesame. An increase in sesame yield by one quintal resulted in

an increase in marketed surplus of sesame by 0.592 quintals, keeping other factors constant. Previous studies, such as Rehima (2007), Geremew (2012) and wendmagegn (2014) found that yield of Red pepper, Sesame and Coffee respectively, affected marketed surplus of each of the commodities significantly and positively.

Frequency of extension contact (EXTC): It was hypothesized that extension service has positive effect on marketed surplus of sesame. In line with the expectation, the result of the study indicated that extension service positively and significantly related to the volume of sesame product supplied to the market at 10% significance level. The result implied that if sesame producer household's number of contact to extension agent increased by one the amount of sesame marketed surplus increases by 0.379 quintal. This is probably due to the reason that extension service is source of information regarding the benefit of marketing and has a strong influence on the farmer's intensity of marketed surplus. Thus, promoting farmers with providing marketing extension services would increase their involvement in marketing of sesame. The result coincided with the studies of Ayelech (2011), Bizualem *et al.* (2015), and Tadele *et al.* (2016) who found that quantity of marketed surplus of mango, coffee, and *teff* were positively and significantly affected by extension contact, respectively.

Land allocated to sesame production (SELAND): The estimated coefficient result for this variable was found to be positively and significantly affected sesame marketed surplus at less than 1%. This implies that, as the area of land allocated for sesame increased by one hectare, quantity of sesame marketed surplus increased by 3.118 quintal. This result revealed that farmers, who have more farm size, are most likely to produce sesame. In fact, a household with large farm size naturally implies an increase in output, which leads to increase market supply. This is in line with the finding of Kindie (2007), Bosena *et al.* (2008), Shewaye (2015), Efa *et al.* (2016), and Sultan (2016) who found that an increase in land allocation increased marketed surplus of sesame, cotton, haricot bean, *teff*, and wheat, respectively.

Access to Information (ACCMIF): Access to market information influenced amount of sesame marketed surplus positively and significantly at less than 1 % significance level. The positive and significant relationship between variables indicated that as farmers have access to market information, the quantity of sesame marketed surplus to the market increase. The coefficient also confirmed that having access to market information would tend to increase the marketed surplus of sesame by 0.882quintal. The result is in line with the study by Mohammed (2012) and wendemagengn (2014) who indicated that having access to market information affected marketed surplus of coffee positively.

Distance to the nearest market (DSMKT): This variable was expected to affect quantity of sesame supplied to the market. It was argued that distant markets increase producers marketing cost, which in turn reduces the volume of output, supplied to the market. The result obtained from the model output indicates that the variable affecting volume of sesame marketed surplus negatively at 1% significance level. An increase of one-kilometer distance from the nearest sesame market would lead to a decrease in the intensity of sesame marketed surplus by 0.199 quintal. The study is supported by Mahilet (2013), wendmagegn (2014), and Efa *et al.* (2016) who revealed that market distance influenced marketed surplus of coffee, malt barley, and *teff* negatively, respectively.

4. Conclusion and Recommendations

The study was in conducted in western Oromia, Ethiopia. The purpose of study was to identify the determinants of sesame marketed surplus among smallholder producers. Both descriptive statistics and econometric analysis were used to analyze the data. The descriptive statistics measures like mean, maximum, minimum, percentage, standard deviation were used in characterizing demographics, farm land allocation, institutional and services. Multiple linear regression econometric model was employed to analyze the data. The result of econometric analysis of OLS finding indicated that sesame marketed surplus is positively and significantly affected by education, farming experience, yield, number of extension contact, area of land allocated to sesame production, access to market information, and distance from the market.

The result of the study indicated that access to extension services being important factors to improve market supply of sesame. Hence, it is recommended to assign efficient extension system, updating the extension agent's knowledge and skills with improved production and marketing system. Education is believed to build knowledge about improved inputs, new technologies, and marketing of the product. Therefore, provision of formal education should be improved. Farming experience is also significant variable that affect marketed surplus positively. Therefore, building farmers' exposure through trainings and creating conducive environment to share their experience with other farmers found in the district and other producing areas. Land is also another variable that significantly affect sesame market supply. Hence, given the limited land available to farmers, it would be very difficult to expand area allocated to sesame production. Instead, it is recommended to intensify inputs of production on the available land. Sesame yield significantly affected marketed surplus of sesame; therefore, it is recommended that increasing productivity of sesame through providing the required inputs at the right time, the required amount, and reasonable price. The survey result indicated that access to market information significantly affected sesame marketed surplus. Therefore, institution that can disseminate reliable and timely market information has to work more for smallholder producers.

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