Socioeconomic Impact of Export oriented Agricultural Production on Farmers, in Eastern Ethiopia

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Abstract

This study was undertaken to assess the socio-economic impact of producing export oriented agricultural crops on the livelihoods of the farmers, in eastern Ethiopia. A random sample of 305 farmers was studied. Comparisons were made between producers and non-producers using the Z- test and regression analysis. It was found that producers of export oriented crops are better off than the non-producers in terms of sending children to elementary school, housing conditions and ability to finance their families' food requirements. The impact of father's education, number of children and livestock ownership on the improvements in the livelihoods of the farmers and the problems facing the farmers were also emphasized.

1. Introduction

Agricultural products like coffee, tea, live animals, fruits and vegetables constitute the highest components of the Ethiopian export trade (CSA, 2001). Although these come from different parts of the country, the eastern regions of the country contribute a great amount. Among the agricultural export oriented products produced in the eastern part of the country, *chat (Khat or Catha adulis)* and coffee constitute the highest shares. According to CSA (2001), among 18 coffee producing areas of the country, the coffee

originating from East and West Hararghe zones of Oromiya Regional State fetched the highest price for 1996/97- 1999/2000 years at Addis Ababa wholesale market. The eastern part of the country is also accessible to the main export outlet, that is, Djibouti port through which international trade takes place.

Different researchers deliberated on the impacts of these products on the consumers, especially on the impact of *chat*. Some of these researches concluded chat as useful for consumers. Nasrula (2004) quoting an official from Somalia, Farah Khayre, stated that *chat* is a vehicle for conflict resolution and develops understanding between people. Pantelis, Hindeler and Taylor (2004) also listed literature on the positive and negative aspects of *chat* on consumers as follows. The principal features of 'Kaht experience' are described as increased levels of alertness, ability to concentrate, confidence, friendliness, contentment and flow of idea (Kenedy, 1987). Khat sessions can provide an arena for communication where serious exchange of ideas and information take place (Weir, 1985; Kennedy, 1987). Kennedy (1983) explained that increased prevalence of respiratory problems in men, resulting from associated with heavy smoking during chat sessions as one of the problems of consuming chat. The other problems associated with chat consumers are diverting income that could be used for family needs to chat chewing (Kalix, 1987), leading to low productivity due to absenteeism and after- effects of its use (Halbach, 1972;, 1979; Elmi, 1983; Giannin et al. 1986; Kalix, 1987).

To the best of my knowledge, there has been no study undertaken on the impact of these products on **the producers**. If we agree that export trade contributes to the economy of the country and the income of those involved in export trade and *chat* and coffee as two of the most important export oriented agricultural products in Ethiopia, we have to study

the impact of producing them on the livelihood of the producers. It is also important to study the problems facing the producers of these products. Scearce and Schermerhorn (2004), discussing the questions concerning export of US and Georgia Agricultural Products, indicate that agricultural export producers fail to understand the implications for the products that they produce. This problem may be more serious in Ethiopia, where most of the farmers are uneducated.

This study focuses on the assessment of socioeconomic impact of producing agricultural exports on farmers in terms of education, improvements in housing conditions, and the ability to finance the family in times of food shortfalls.

2. **Materials and Methods**

2.1. **Data Collection**

The study has been undertaken in West Hararghe and East Hararghe zones of Oromiya and Jijjiga zone of the Somali National Regional State. The participants of the study were selected using multistage random sampling. First the districts in each zone were categorized according to the types of crops they produce. Random samples of districts were then selected at the first stage. On the second stage, the peasant associations (PAs) were grouped in the same way and sampled for the study. At the third stage, the villages were grouped in the same procedure and sampled randomly. Finally, the households (farmers) were selected using systematic random sampling procedure. The sampling frames were prepared by discussing with PA leaders.

The secondary data were collected from Agricultural Development Offices and publications of the Central Statistical Authority (CSA) of Ethiopia. On the other hand,

Primary data were collected (March- November 2003) by personal interview of the farmers, using a questionnaire that had been pre- tested on the farmers residing in the villages around Alemaya University. The summary of the sample size taken for the study is given in table I.

Table I: **Sample size taken for the study**

Zone	District	Sample Size
West Hararghe	Mi'esso	33
	Mesela	69
East Hararghe	Bedeno	43
	Haromaya	48
	Babile	78
Jijjiga	Jijjiga	34
Total		305

2.2. **Methods of Data Analysis**

The main objective of this study was to assess the impact of producing agricultural exports. To meet this objective, different comparisons were made between the producers and non- producers. This study defines **producers** as those who produce either chat or coffee or both. If the farmer produces neither *chat* nor coffee, he/she is considered as **non-producer**. To assess the impact of producing agricultural exports on the educational status of the family, the researcher used the ratio of children in schools and those who have attended regular schools to the total number of school aged children in the family, expressed as percentage. The ability of the household to feed the family was also seen in

terms of the frequency of feeding the children and the adult. The percentage of farmers having corrugated iron sheet roofed houses, the percentage of farmers having separate kitchens other than their living rooms for cooking and the percentage of farmers having separate structure for livestock other than the living room were used to assess the impact of agricultural export products on the housing conditions of the farmers. The strategy used by the farmers to finance the household expenditures in times of food shortfalls and/ or crop failure was also another parameter to assess the impact on the food security of the farmers. With this respect, the percentage of farmers using food aid as one of the strategies or the only strategy in times of food shortfalls and crop failure was used.

There are different techniques used in assessing an impact. These include the mean test, regression analysis and partial budgeting. The partial budgeting technique is a planning and decision making frame work used to compare the costs and benefits of alternatives faced by a farm business (Roth and Hyde, 2002; Dalsted and Gutierrez, 2004). The nature of the data used for this study, however, does not help us to compute costs and benefits. Thus, I used the mean test and regression analyses which are explained as follows.

The Z- test for the difference between two population means

Suppose that there are two samples drawn independently from two populations with mean μ_1 and μ_2, respectively. Then, the test about the significance of the difference between the two means takes one of the following forms:

$H_0: \mu_1-\mu_2=0$ (1)

$H_1: \mu_1-\mu_2\neq0$

Or

H_0: $\mu_1-\mu_2=0$ (2)

H_1: $\mu_1-\mu_2>0$

Or

H_0: $\mu_1-\mu_2=0$ (3)

H_1: $\mu_1-\mu_2<0$

Where, H_0 and H_1 stand for the null and alternative hypotheses, respectively.

The test statistic is then given by:

$$Z=\frac{\overline{X}_1-\overline{X}_2}{\sqrt{\frac{S_1^{\,2}}{n_1}+\frac{S_2^{\,2}}{n_2}}} \quad (4)$$

Where,

n_1= sample size from population 1,

n_2= sample size from population 2

$\overline{X}_1$ = the mean of the sample taken from population 1.

$\overline{X}_2$ = the mean of the sample taken from population 2.

S_1^2= the variance of the sample taken from population 1

S_2^2= the variance of the sample taken from population 2

For a specified Type I error α , the null hypothesis will be rejected if: $|Z|>Z_{\alpha/2}$, for the first form; $Z>Z_\alpha$ for the second form; and $Z<-Z_\alpha$ for the third form of the hypothesis. Rejecting the null hypothesis means that there is a significant difference between the means of the two groups.

The Z- test for the difference between two populations percentages

With a categorical data one of the analyses of interest is finding the proportion of elements belonging to each of the categories. We can also test the difference between two population proportions. The chi- square test of independence and the Z- test are used for this purpose. The Chi- square test is used to test a two- tailed alternative, but the Z- test can be used both for one tailed and two tailed alternatives. Most of the tests in this study evaluate whether one group is better than the other. Thus, the Z- test has been used for all the tests concerning the differences between two populations' proportions. The method is described as follows:

Let P_1 and P_2 be the percentage of elements having the characteristics of interest in population I and population II, respectively. The test for the significance of the difference between P_1 and P_2 takes one of the following forms.

H_0: P_1-P_2 =0 (5)

H_1: P_1-P_2 ≠0

Or

H_0: P_1-P_2 =0 (6)

H_1: P_1-P_2 >0

Or

H_0: P_1-P_2 =0 (7)

H_1: P_1-P_2 <0

For samples of large sizes n_1 and n_2, the test statistic is given by

$$Z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\frac{\overline{P}(1-\overline{P})}{n_1} + \frac{\overline{P}(1-\overline{p})}{n_2}}} \quad (8)$$

Where,

$\hat{p}_1$ = the percentage of sample 1 with the desired characteristic

$\hat{P}_2$ = the percentage of sample 2 with the desired characteristic

$$\overline{P} = \frac{X_1 + X_2}{n_1 + n_2} \tag{9}$$

X_1 = the number of elements having the desired characteristic in sample 1

X_2= the number of elements having the desired characteristic in sample 1

The decision rule is the same as that in the tests concerning the two populations' means. In this study population 1 refers to the non- producers and Population 2 to the producers.

The Regression Analysis

The method of data analysis to measure the functional relationship between a quantitative dependent variable and one or more independent variables is the regression analysis. A linear regression equation of the a dependent variable Y on k independent variables X_1, X_2, …, X_k is given by

$$Y=\beta_0+\beta_1X_1+\beta_2X_2+….+\beta_kX_k+\varepsilon \tag{10}$$

Where,

β_1,β_2, …, β_k are the slopes (the change in Y for the unit change in the explanatory variable X_i)

β_0 is the value of Y when all independent variables assumes zero value

ε is the random term.

The coefficients of the linear regression model are estimated under the assumption that the random term assumes normal distribution with zero mean and constant variance. The values of the random term are also assumed to be independent.

After fitting a linear regression model by estimating the coefficients, we have to test whether the coefficients are statistically significant. This can be done either by testing the overall significance of the model or by testing the significance of the individual coefficients.

The test about the overall significance of the model uses the F- test and test whether at least one of the coefficients are significantly different from zero. The test about individual coefficients uses the t- test and tests whether each independent variable is statistically significant in determining the dependent variable.

The null and alternatives hypotheses in the test about individual coefficient are given by:

H_0: $\beta_i=0$

H_1: $\beta_i\neq0$

Where i=1, 2, …., k.

The test statistic is given by

$$t=\frac{\hat{\beta}_i}{SE_{\hat{\beta}_i}} \tag{11}$$

Where $\hat{\beta}_i$ is the estimated value of β_i

$SE_{\hat{\beta}_i}$ is the standard error of the estimate of β_i

If this calculated t value is greater than the tabulated value of t with n-k-1 degrees of freedom (where n is the total number of observations and k is the number of independent variables in the model) at α level of significance we conclude that the null hypothesis is rejected and the coefficient is statistically significant.

In addition to testing the significance of the coefficients we have to test whether the assumptions of ordinary least squares method are met (for how to do this the readers are

advised to consult any statistics or regression analysis books). Concerning this study, all attempts were made to test the significance of the model.

Logistic Regression Analysis

Sometimes there are conditions in which we have a qualitative dependent variable assuming only two values- yes or nor, absence or presence, true or false and so on. The type of regression used in such cases is called the logistic regression. This type of regression can be explained as follows:

Suppose we have a dependent variable assuming only two values 1 (for presence of a character of interest and 0 for the absence of the character of interest) and K explanatory variables. The conditional expectation of Y given X, E(Y=1/X) is given by:

$$\pi(x) = \frac{e^{\beta_0 + \beta_1 x}}{1 + e^{\beta_0 + \beta_1 x}} \tag{12}$$

Where β_0, β_1 are the coefficients.

The logarithmic transformation of equation (12) also called the logit transformation yields:

$$g(x) = \ln\left[\frac{\pi(x)}{1-\pi(x)}\right] = \beta_0+\beta_1 x+\varepsilon \tag{13}$$

For K explanatory variables $x_1, x_2, \ldots, x_K$, g(x) is given by

$$g(x)=\beta_0+\beta_1 x_1+\beta_2 x_2+\ldots+\beta_K x_K+\varepsilon \tag{14}$$

The principles that guide an analysis using linear regression analysis will also guide us in logistic regression except that the dependent variable in logistic regression is binary and the error terms have binomial distribution (Hosmer and Lemeshow, 1989).

4. Results and Discussions

4.1. The Impact of Producing Export Oriented Agricultural Crops on the Educational Status of the family

The percentage of children aged 7 years and above was taken to compare the educational statuses of the producers and non-producers. The result shows that there are 156 producers and 71 non- producers having children in this age group. The mean percentage of children who had completed or were attending elementary schools at the time of the survey was found to be 41.2% and 30.86% for the producers and non- producers, respectively as shown in table II below.

Table II: Comparison of the average percentage of children whoever completed or reached elementary school

Farmer group	Sample size	Mean	St. dev
Non- producer	71	30.86	34.94
Producer	156	41.2	40.58

To test the significance of this difference I used the one tailed test given by (3). The calculated Z using equation (4) was found to be -1.96. This value is less than the corresponding tabulated value, -1.64, at α=0.05. Thus we reject the null hypothesis that there is no difference in the proportion of children who ever reached or in elementary schools between the producers and non- producers, and conclude that the percentage is higher in the producers group. This may imply that producing export commodities builds the capacity of the farmers to cover financial requirements for the education of their children.

Attempts were also made to determine other factors contributing to the variation in the percentage of school aged children sent to elementary schools. Regression analysis using the method of ordinary least square yielded the following result.

$$E= 38.6+2.5X_1-5.9X_2 \quad (15)$$

Where,

E= the number of children who ever reached elementary school divided by the total number of school aged children expressed as percentage

X_1= area of land farm allotted to chat (in *timad*)*

X_2= number of cows owned by the farmer

Equation (15) shows that as the area allotted to *chat* production increases by 1 *timad*, the percentage of children sent to school increases by 2.5. This is another evidence supporting the results obtained using the mean test. As the number of cows' increases, however, the percentage of children sent to school decreases. The possible reason for this may be that children help parents by herding cattle. Other variable like distance from elementary school, area of farm land allotted to cereals, area of farm land allotted to coffee, father's education, mother's education, total number of children, father's age, mother's age, household head (male or female), number of oxen, number of sheep and number of goats were found to be insignificant in determining the dependent variable under consideration.

When we see the levels of education above elementary school, however, there are no significant differences between the producers and the non-producers. The mean of the percentage of children who ever completed or were attending secondary school was 2.1%

* *Timad* is a local unit of measurement where, 1 hectare =8 *timad*

and 1.2%, respectively for the non-producers and producers. There was no one having his/her child ever completed grade 12, among the studied farmers. That means both the producers and non- producers cannot be considered having their children schooled above elementary school. With this respect, the distances from secondary schools can be one factor- there are some farmer households about 40 kms far from secondary schools. Investigation is also required to be done on the farmer's awareness about the importance of education.

4.2. **The Impact on Household's Ability to Feed the Family**

This impact is seen with respect to the frequency of feeding children and the adult, and the strategies used by the household in times of food shortage. The results show that the producers are better than the non-producers in all these three criteria.

The frequency of feeding the children (see table IV) is higher for the producers than the non-producers. To test the significance of this difference I used the one tailed test given by (3). The calculated Z using equation (4) is found to be -2.3. This value is less than the corresponding tabulated value, -1.64, at the 0.05 level of significance. Hence, we can reject the null hypothesis that states there is no significant difference in the frequency of feeding the children between non-producers and producers and conclude that the export producers feed their children more times than the non-producers do.

Table IV: Frequency of feeding children for non- producers and producers

Farmer group	Number of households	Mean	St. dev
Non- producer	84	3.36	0.89
Producer	198	3.59	0.98
Total	282		

As the frequency of feeding the children may depend on other factors in addition to the production of export crops, I have tried to fit a regression model of the frequency of feeding children on the area of farmland allotted to chat, area of farmland allotted to coffee, area of farmland allotted to cereals, father's age, mother's age, father's years of education, mother's years of education, total number of children, household head type(male or female), number of cows, number of sheep and number of goat. The backward stepwise variable selection technique yielded the following result:

$$F_c = 3.899+0.043X_1-0.013X_2-0.007X_3 \quad (16)$$

Where,

F_c= frequency of feeding children

X_1= area of farmland allotted to chat (in timad)

X_2= area of farmland allotted to cereals (in timad)

X_3= father's age in years

As it can be seen from equation (16) the frequency of feeding children increases with the increase in the area allotted for chat production. This may be due to the fact that sales of chat help the farmer purchase food for the family and/or prevent him from selling the crops he produces. On the other hand, the increase in the area allotted to cereals results in

the decrease in the frequency of feeding children. This may be explained by the fact that if there is less productivity of cereal crops, increasing the land allotted to them, can simply be decreasing the area to be allotted to other crops that could give higher yield per small plot of land. The increase in the age of father was also found to result in the decrease in the frequency of feeding the children. As one gets older, the capacity to produce may decrease. Those who are relatively young may supplement their family needs in many ways- daily labour, selling wood... and petty trades.

Similarly, the frequency of feeding the adult, (see table V), is higher for the producers group than the non-producers. The calculated Z for this case is found to be -2.78, which is still less than the tabulated value -1.64, at the 0.05 level of significance. In this case also we reject the null hypothesis that the frequency of feeding the adult is the same for producers and non-producers, and conclude that the producers feed their adults more number of times than the non-producers.

Table V: Frequency of feeding adults for non- producers and producers

Farmer group	**Number of households**	**Mean**	**St. dev**
Non- producer	87	2.26	0.56
Producer	200	2.46	0.56
Total	287		

Frequency of feeding the adult was also seen as a function of the area of farmland allotted to chat, area of farmland allotted to coffee, area of farmland allotted to cereals, father's age, mother's age, father's years of education, mother's years of education, total number of children, household head type (male or female), number of cows, number of sheep and

number of goats owned by the farmer. The backward stepwise variable selection technique yielded the following result:

$$F_a = 2.47+0.042X_1-0.017X_2+0.04X_3 +0.027X_4 \quad (17)$$

Where,

F_a= frequency of feeding adult

X_1= area of farmland allotted to chat (in timad)

X_2= area of farmland allotted to cereals (in timad)

X_3= father's years of education

X_4= number of goats owned by the farmer

As it can be seen from equation (17), the frequency of feeding adult increases with the increase in the area of farmland allotted to chat, father's years of education and the number of goats owned by the farmer. Chat is a cash crop that can be sold any time to purchase food crops for the family. It is also an ever green crop. The sales of goats can also help the farmer supplement his/her family food requirements. In terms of its market also, goat meat is the most commonly used in Hararghe highland. Father's education can help the frequency of feeding the adult in many ways. Proper use of what is produced, producing vegetables to supplement family food requirement, and even respecting regular meal times may be some of the justifications. The increase in the area allotted to cereals may not bring significant increase in the yield except sharing the farmland that could be used for other crops. Thus, may result in the decrease in the frequency of feeding the adult.

It can also be observed from the results that neither the non- producers nor the producers could feed their adults three times a day.

The comparison of the farmers based the strategies used for tackling the problems of food shortage and crop failure is also another important point of comparison between the producers and non-producers. Some households sell livestock, some sell chat and/or coffee and others go for food aid when they face such problems. This study compared the percentage of farmers using food aid as the sole strategy or one of the strategies when such problems occur. The result shows that, using food aid as a strategy is higher among the non-producers than the producers (see table VI below).

Table VI: Distribution of the farmers by the Strategy do you use in times of food shortage or crop failure

	Food Aid?		
Farmer Group	No	Yes	Total
Non-producer	51 (54.8%)	42 (45.2%)	93 (100%)
Producer	163 (76.9%)	49 (23.1%)	212 (100%)
Total	214 (70.2%)	91 (29.8%)	305 (100%)

Figures in parentheses indicate the percentage within the farmer group.

To test whether this difference is significant, I used the Z- test for the difference of two populations' percentage. The calculated Z using equation (8) is found to be 3.95. This value is greater than the corresponding tabulated value for α=0.05, which is 1.64. Thus, we can reject the null hypothesis that the percentage of farmers using food aid as a strategy is the same for the non-producers and producers; and conclude that the proportion is higher in the non-producers group. The implication may be that production of export oriented crops would enable the farmers to improve their asset base and enhance their capacity to absorb shocks during food shortfalls.

As it was done for other variables, determination of the factors contributing to the probability of taking food aid as one of the strategies or the sole strategy in times of food of shortfalls was done using the logistic regression analysis. Area allotted to chat, area allotted to coffee, area allotted to cereals, father's education, mother's year of education, number of children, household type (male or female), number of oxen, number of cows, number of sheep, number of goat, number of calves, mother's age and father's age were considered as explanatory variables. The backward conditional variable selection method yielded the following result.

$$F_{ad}=-0.679-0.366X_1+0.117X_2-0.345X_3 \quad (18)$$

Where,

F_{ad}= probability of going for food aid,

X_1= area of farmland allotted to chat

X_2= Number of children

X_3= Number of oxen

As it can be seen from equation (18), the probability of going for food aid decreases with the increase in the area allotted to chat and the number of oxen; and increases with the increase in the number of children. The implication may be that farmers can sale chat to finance the family food requirement rather than going for food aid. The number of oxen can also help the family's food security either by enabling the farmer plough with them or through the money gained by selling. The increase in the number of children may result in the amount of food need and other financial requirements. Thus, what the farmer produces cannot cover all these needs and the farmer is forced to go for food aid.

4.3. **Impact on Housing Conditions of the Household**

This study considered the roofing, wall, floor, the presence of separate kitchen, and the presence of separate structure for livestock as characteristics to assess the improvements in the housing conditions of the farmers.

The results of the analysis concerning the material used for roofing the houses (table VII) show that the proportion of the farmers having corrugated iron sheet roofed houses is 25.8% and 48.6% among the non- producers and the producers, respectively.

Table VII: Distribution of Farmers by Type of Materials for Constructing Roofs

	Roofing Material		
Farmer Group	Grass	Corrugated iron Sheet	Total
Non- Producer	69 (74.2%)	24 (25.8%)	93 (100%)
Producer	109 (51.4%)	103 (48.6%)	212 (100%)
Total	178 (58.4%)	127 (41.6%)	305 (100%)

Figures in parentheses indicate the percentage within the farmer group

To test whether this difference is significant, I used the Z- test for the difference of two populations' percentage. The calculated Z using equation (8) is found to be 3.84. This value is greater than the corresponding tabulated value for α=0.05, which is 1.64. Thus, we can reject the null hypothesis that the percentage of farmers owning corrugated iron sheet roofed houses is the same for the non-producers and producers and conclude that the proportions is higher in the producers group. Its implication may be that the price of

the corrugated iron sheet is higher than that of the grass and thus those who have export oriented products can afford the price of the corrugated iron sheet.

In fact the farmer's having corrugated iron sheet roofed house can be a function of many factors. Attempts were also made to identify these factors, using the method of logistic regression. Area of farmland allotted to chat, area allotted to coffee, area allotted to cereals, education of father, education of mother, number of children, type of household (male or female), number of cows, number of oxen, number of sheep and number of goats were taken as explanatory variables. The backward conditional method of variable selection yielded the following result.

$$R=-0.45+0.3X_1-0.14X_2+0.25X_3+0.29X_4+0.08X_5 \quad (19)$$

Where,

R= Probability of having corrugated iron sheet

X_1= area of farmland allotted to chat

X_2= area of farmland allotted to cereals

X_3= years of education of the father

X_4= number of cows owned by the farmer

X_5= number of goats owned by the farmer

It can be seen from equation (19) that the probability of having corrugated iron sheet roofed house increases with the increase in the area allotted to chat, years of education of the father, number of cows owned by the farmer, and number of goats owned by the farmer; and decreases with the area allotted to the cereals. The area allotted to chat, number of cows and number of goats all contribute directly to the financial ability of the farmer to purchase corrugated iron sheets. Father's education can contribute through

improvements in other factors or preference for clean residence. The area allotted to cereals either decrease the area to be allotted to other cash crops and/or their prices are low and cannot able the farmer to purchase corrugated iron sheets.

The analysis of the distribution of farmers by cooking place (table VIII) shows that the percentage of farmers using separate kitchens for cooking other than their living rooms is 21.7% and 40.5% for non-producers and producers group, respectively.

Table VIII: Distribution of Farmers by Cooking Place

	Cooking Place		
Farmer Group	In the living room	Separate Kitchen	Total
Non- Producer	72 (78.3%)	20 (21.7%)	92 (100%)
Producer	125 (59.5%)	85 (40.5%)	210 (100%)
Total	197 (65.2%)	105 (34.5%)	302 (100%)

Figures in parentheses indicate the percentage within the farmer group.

To test whether this difference is significant, I used the Z- test for the difference of two populations' percentage. The calculated Z using equation (8) was found to be -3.8. This value is less than the corresponding tabulated value for α=0.05, which is -1.64. Thus, we can reject the null hypothesis that the percentage of farmers having separate kitchens for cooking is the same for the non-producers and producers and conclude that the proportion is higher in the producers group. Its implication may be that producing export oriented crops enable the farmer build separate cooking place to have clean living room.

Having kitchen can be a function of many factors in addition to the economic status of the farmers. To identify these factors logistic regression was used with cooking place as the dependent variable assuming value 1 if the farmer has separate kitchen and 0 if not.

The proposed explanatory variables were area allotted to chat, area allotted to coffee, area allotted to cereals, education of the father, education of the mother, number of children, type of household (male or female), number of cows, number of oxen, number of sheep, number of goats, and number of calves. The backward conditional variable selection method produced the following results.

$$K= -0.931+0.332X_1-0.511X_2-0.147X_3+0.274X_4+0.13X_5+0.087X_6 \quad (20)$$

Where,

K= the probability of having separate kitchen than the living room

X_1= area of farmland allotted to chat

X_2= area of farmland allotted to coffee

X_3= area of farmland allotted to cereals

X_4= years of education of the father

X_5= number of children

X_6= number of goats

As we can see from equation (20), the probability of having separate kitchen other than the living room increases with the increase in the area allotted to chat, years of education of the father, number of children and number of goats; and decreases with the area allotted to cereals and the area allotted to coffee. Increase in the area allotted to chat and number of goats can be taken in terms of their contributions to the family's financial ability. Years of education of the father can contribute for building separate kitchen either through economic contribution of education or the preference to have clean living room. Number of children can enforce the farmer to build separate kitchen for having sufficient space in the living room and/or care for children from fire and smokes. The area allotted

to cereals results in the decrease in the probability of having separate kitchen may be due to low productivity of the farmland and low price of the products. The negative relation between the area allotted to coffee and the probability of having separate cooking kitchen other than living room may be related to the problems facing the producers- market and business awareness of the farmers. I came to learn from my discussion with the district rural and agricultural development experts of Mesela district, for example, that there is only one sole buyer of coffee and the farmers have no opportunities to bargain on prices. The survey finding also shows that farmers do not know the prices of their products at the national and international markets.

To see the improvements brought to the housing conditions of the farmers because of producing export oriented products, I have also considered the presence of separate living structure for livestock. The proportion is higher among the non-producers than the producers (see table IX).

Table IX: Distribution of Farmers by living places for livestock

	Where do your animals live		
Farmer Group	In the living room	In Separate room or fence	Total
Non- Producer	52 (60.5%)	34 (39.5%)	86 (100%)
Producer	131 (63%)	77 (37%)	208 (100%)
Total	183 (62.24%)	111 (37.76%)	294 (100%)

Figures in parentheses indicate the percentage within the farmer group.

To test whether this difference is significant I used the Z- test for the difference of two populations' percentage. The reference for comparison is the ability to have separate

living spaces for livestock. The calculated Z using equation (8) is found to be 0.3146. This value is greater than the corresponding tabulated value for α=0.05, which is -1.64. That is, there is no sufficient evidence from the sample to reject the null hypothesis that the percentage of farmers having separate living room for animals is the same for the non-producers and producers and conclude that the proportions is the same for the two groups.

The farmers' using separate structure than living room was found to be affected by a combination of many factors- area of farmland allotted to chat, area of farmland allotted to coffee, father's education, number of oxen and number of goats owned by the farmer, as shown by equation (21) below (Chat is significant at 0.10 level whereas all others are significant at 0.05 level of significance).

$$H_u=-1.08+0.122X_1-0.571X_2+0.169X3+0.297X4+0.10X_5 \quad (21)$$

Where,

H_u= probability of having separate living structure for livestock

X_1= area of farmland allotted to chat

X_2= area of farmland allotted to coffee

X_3= father's yeas of education

X_4= number of oxen

X_5= number of goats

Equation (21) shows that the probability of having separate living structure for livestock increases with the increase in the area allotted to chat, years of education of the father, number of oxen, and number of goats; and decreases with the increase in the area allotted to coffee. The implication concerning the area allotted to *chat* can be taken as the

economic contribution of chat; the number of livestock obviously forces the farmer to have extra structure than living room; education of the father can contribute in terms of awareness about the impact of living with animals one family health.

Concerning the housing conditions in terms of walls and floors, the survey results shows that all farmers own houses whose walls are constructed of wood and with muddy floors.

4.4. **Problems Facing the Farmers**

The major problems reported by the farmers include farmland size, drought, low prices of the products and food shortage that is caused by different problems. Among the interviewed 305 farmers, 65.2% reported that they have problems related to farm land; and 86.2% reported that they faced food shortage at different times. One of the problems coffee producers face in Mesela District, as reported by the experts in the District's Rural Development Office, is that there is only one buyer and the producers have no opportunities to bargain, and are forced to accept the price that the sole buyer fixes. The producers of cereals have also the problems of low prices in addition to the low productivity and small sizes of farmlands.

The survey results also show that the farmers lack the habits of saving in cash or kind, for the reason that what they produce cannot cover even their family needs, let alone saving. Absence of knowledge of the value of their products at the national and international markets was also reported from all the studied farmers. This may imply that they assume that their products are meant only for local use.

5. **Conclusions**

The main objective of this study was to assess the socio-economic impact of producing agricultural exports on the livelihoods of the farmer with particular emphasis to education, food and housing conditions. Attempts were also made to identify the factors contributing for the changes in the livelihoods and describe the problems facing the farmers in the area.

Multistage random sampling was used to collect data from the farm households. Two mean test and regression analyses were used to analyze the data.

The results of the analysis showed that the producers of agricultural exports are better off than the non-producers in their abilities to send children to school (to the level of elementary school), own houses roofed with corrugated iron sheet, having separate kitchens for cooking, frequency of feeding both the children and the adult, and finance the family in times of food shortage, crop failure and or other difficulties. Producing export oriented products, especially *chat*, made the producers more food secured than the non-producers.

In addition to the production of export oriented products, other important factors contributing to the changes in the livelihoods of the farmers were also identified in the survey. The number of oxen negatively affected the percentage of children to be sent to school. It may mean that the children are used for herding. However, the same variable contributed positively to the food security of the family. The probability of opting for food aid in times of food shortfalls decreases with the increase in the number of oxen. Increase in father's age resulted in the decrease in the frequency of feeding the children. This may be due to the fact that as one gets older the capacity to produce decreases

coupled with many responsibilities. Father's years of education affected positively the frequency of feeding the adult, the ability to own corrugated iron sheet roofed houses, ability to own separate kitchen for cooking other than the living room, and building separate structure for livestock than the rooms in which humans live. This may also be due to the fact that education can contribute to the improvements in the livelihood of a family. Number of goats owned by the farmer contributes positively to the frequency of feeding the adult, ability to own corrugated iron sheet roofed houses, and ability to build separate kitchens for cooking other than the living room. The number of children negatively affected the food security of the family as positively affected the probability of opting for food aid at the times of food shortfalls.

There are also many areas were the export producers are not better than the non-producers. The percentage of children who learned upto secondary school is very small in the two groups. There is no one having a child educated above secondary school among the studied farmers. Farmers in the both groups do not have the habits of saving and accumulating fixed assets. The farmers were also found to lack the knowledge of the value of their products at the national and international markets. The survey results show also that most of the farmers have problems related farm size, drought, food shortage and low prices of products.

In general, it can be concluded that production of export oriented agricultural products enables the farmer to send children to school, have improved housing conditions, and food secured than the non-producers. The contributions of livestock ownership, education of the parents, numbers of children and other factors to the improvements in the livelihoods of the farmers should also be emphasized.

6. **Recommendations**

Based on the results discussed above, the researcher would like to forward the following recommendations:-

1. Creating the means by which those farmers who do not produce agricultural exports can diversify their products to supplement their financial needs.
2. Emphasis should also be given to providing the farmers with high yielding varieties and/or creating mechanisms to produce more on small farmland size.
3. Creating the awareness about the uses of education both among the producers and non- producers and facilitating conditions so that the farmers can get secondary education. This can be done by incorporating the uses of educating children the agricultural extension education and/or using religious institutions to deliver the same on their ceremonies.
4. Inculcating business awareness among the producers. That means, the farmers should be made know the values of their products and produce not only for self and/or local consumption but think globally.
5. Government should devise other mechanisms of helping the farmers other than providing food aid. The government should enable the farmers to develop the sense of independence.
6. Establishing rural banks and encouraging the farmers to save in cash.
7. A study should also be undertaken on the problems of education in the region.

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