



ACCESS TO CREDIT AND ITS DETERMINANTS IN GUBALAFTO DISTRICT

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ABSTRACT

Access to credit is an indispensable prerequisite for agricultural development where agriculture is found with a shortage of agricultural technologies and recurrent drought. This paper examines access to credit and its determinants in Gubalafto district. Primary data from 250 households were collected. To select a sample household, a multistage sampling technique was exercised. Questionnaire and interview were utilized to collect primary data. Both descriptive and econometric methods of analysis were employed. For econometric analysis with necessary statistical diagnosis tests, a logistic regression procedure was developed on farmers' socio-economic cross-sectional data collected in 2018.

The descriptive statistics revealed that the amount of credit is very low and the interest rate is high. The Econometrics model showed that sex, education level, family size, land size of the household, access to extension service and annual earned income were found to be significant in determining access to credit. These results have important policy implications to reduce interest rates and increase loan size and minimizing the distance between credit institutions and farm households.

KEYWORDS: 1.ACSI, 2.Agriculture, 3.Households, 4.Logistic Regression, 5.ROC Curve.

DATABASE AND METHODOLOGY

This study employed both primary and secondary data. Primary data was collected through administering a structured questionnaire and interview to rural households in Gubalafto District. The questionnaire was designed to gather qualitative and quantitative data. In addition, secondary sources were used to substantiate the analysis and get support for primary data.

Three stage sampling was used to acquire the required primary data. Firstly, Gubalafto district was selected purposely. Gubalafto district consists of thirty one sub-districts. Secondly, among Gubalafto's sub-districts, seven sub-districts were selected purposively. In



the third-stage simple random sampling was employed. Finally, a probability proportional to sample size sampling procedure was employed to select 250 sample households.

Two hundred fifty sample households were taken based on (Glenn, 1992) sampling method. According to him, for the population greater than 100,000 (139,825 = total population of Gubalafto District), it is possible to take 250 samples at 95% confidence level, degree of variability = 0.07 and level of precision=7%. In addition, according to 2007 census the number of households in Gubalafto District is 40569. It is once more possible to use 250 samples because the maximum sample size is 204, but 250 is greater than 204. This would help us to increase the precision of the result; in statistics to the degree that there is more sample size precision of the result would increase.

The study employed the logit model in line with (Copas, 1998).

$$P_i = F(Z_i) = \frac{1}{1 + e^{-(\alpha + \sum \beta_j X_j)}} \dots \dots \dots (1)$$

Where P_i = the probability that an individual is being food secure given X_i

X_i = a vector of explanatory variables

α And β = regression parameters to be estimated.

e = the base of the natural logarithm

For ease of interpretation of the coefficients, a logistic model could be written in terms of the odds and log of odd. The odds ratio is the ratios of the probability that a household would be food secure (P_i) to the probability of a household not being food secure ($1 - P_i$). That is:

$$\frac{P_i}{1 - P_i} = e^{Z_i} \dots \dots \dots (2)$$

Taking the natural logarithm of the equation yeilds

$$Ln\left(\frac{P_i}{1 - P_i}\right) = Z_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots \dots \dots + \beta_m X_m \dots \dots \dots (3)$$

If the error term taken into account the equation becomes

$$Ln\left(\frac{P_i}{1 - P_i}\right) = Z_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots \dots \dots + \beta_m X_m + e_i \dots \dots \dots (4)$$



The dependent variable in this study is Access to credit. It is dichotomous taking: 1 when having access to credit and 0 when a farmer is having no access to credit. The independent variables contain both dichotomous and continuous variables. Access to credit was estimated using computer software STATA 14 program for descriptive and econometric analysis.

The Model is expressed as follow with the dependent and all explanatory variables which are included in the model.

$$\text{Credit} = \alpha - \beta_1\text{Agehh} - \beta_2\text{Sexhh} - \beta_3\text{Eduhh} + \beta_4\text{Famsize} + \beta_5\text{Landize} + \beta_6\text{Dpratio} - \beta_7\text{Amntfert} + \beta_8\text{TLU} + \beta_9\text{Extension} - \beta_{10}\text{Dist} + \beta_{11}\text{Nonfarminc} + \beta_{12}\text{Yincome} + \mu$$

.....(5)

Table 1: Measurements and hypothesis of independent variables

Variable	Type	Definition	Measurement	Expected sign
Agehh	Continuous	Age of the household head	Year	-
Sexhh	Dummy	Sex of Household Head	1=male; 0=female	-
Edu	Continuous	Education level of the household	Year of schooling	-
Famsize	Continuous	Total number of family size	Number of family	+
Landsize	Continuous	Amount of land owned by hectare	Hectare	+
Dpratio	Continuous	Dependency ratio	Ratio of number of dependent family to active labour force of the family	-
Amntfert	Continuous	Amount of fertilizer used in farm	Kilogram	+
Tlu	Continuous	Number Livestock	TLU	+
Extension	Dummy	Access to extension service	1 if a household has access to extension service, 0 if not	+
Dist	Continuous	Distance from credit institution	Kilometer	+
Nonfarminc	Dummy	participation in non-farm job	1 if participated in non-farm job, 0 if not	+
Yincome	Continuous	The yearly income earned	Birr (Ethiopian Currency)	+

Source: own definition



STUDY AREA

The survey was conducted from February 2018 to April 2018 in Gubalafto districts of Amhara Region, Ethiopia. **Gubalafto district is one of eleven districts in North Wollo of Amhara Regional State. The district is located between 39⁰12'9" and 39⁰45'58" East and 11⁰34'54" and 11⁰58'59" North. It is bounded on the North by Gidan; to the North West by Meket; to the northeast by Kobo; to the east Afar regional state; to the south North Wollo zone; to the south east by Habru district and to the west Dawunt and Delanta. The district has 31 rural sub-districts.**

Gubalafto district has a total population of 139,825 according to 2007 census. Of which, 50.6% are men and 49.4% women; and only 3.49% are urban inhabitants. With an area of 900.49 square kilometers, Gubalafto has a population density of 155.28 which is greater than the zone average of 123.25 persons per square kilometer. About 32,824 housing units and 33,676 households were counted in this Woreda. The average persons to a household were 4.15. Gubalafto district have been grouped amongst the 48 districts identified as the most drought prone and food insecure districts in the Amhara Region State (Belay and Eyasu, 2019).

INTRODUCTION

In Ethiopia, different economic policies have been applied to improve the living standards of the people, to achieve economic growth and to renovate agriculture by industrial economy. Back to fifteen years, even if there was economic growth, Ethiopia remains one of the poorest countries in the world, ranking 169th out of 177 countries on the Human Development Index and 105th out of 108 countries on the Human Poverty Index (IFAD, 2011). According to Mulat et al., (2004) the Ethiopian economy is among the most vulnerable economies in Africa and its performance has been less than satisfactory. The economy is also characterized by the persistence of low technology, intensive less productivity agriculture dominated by smallholder farm households (Tilahun, 2015). The country still depends highly on agriculture.

The sector is dominated by over 15 million smallholders producing about 95 percent of the national agricultural production. This shows that the overall economy of the country and the food security of the majority of the population depend on small holder agriculture. The



growth of agricultural sector is taken as an engine and the last resort to take-off the national economy (CSA, 2017/18). Although we deemed the task of agriculture as described above, the dominance of agriculture has not changed over time mainly because of its poor performance in terms of generating surplus that could be invested in other sectors of the economy (Mulat et al., 2004). At this time, farmers face credit constraints in financing, and modern agricultural inputs are the most important barriers for the development of small holder agriculture (Komicha, 2007).

Credit is a crucial instrument for rural development (Komicha, 2007; Kumar, 2020). This credit has countless advantages for rural households. According to Abi (2003) access to credit pledges the availability of financial resources which can be used to buy inputs, finance business start ups and hence reduce poverty. In addition, better access to credit is able to open up new economic activities and significantly improve their income. Better agricultural productivity can be achieved through technology adoption complemented with better financial infrastructure that fills the financial gaps of smallholder farmers by creating better provision of agricultural credit (Tilahun, 2015; Kumar, 2020). Rural credit has proven to be a powerful instrument against poverty reduction and development in rural areas (Ololade and Olagunju, 2013).

In spite of several MFIs are found currently in Ethiopia the system structure has remained the same, and no change is expected. Rural households with sustainable access to a range of financial services have been met satisfactorily. The country also ranks 167 out of 189 economies for access to credit on doing business; firms are more likely to be credit constrained than global comparators. Financial product development in the financial sector has generally been limited; most of the savings and loans products at the MFIs are driven by donor programmes (IFAD, 2018).

DISCUSSION

Descriptive Statistics

The total family members of the sampled households were 250 of which 240 were males and 10 females. Out these respondents, 101 households (40.4 percent) did not have access to credit, but 149 (59.6 percent) had access to credit. Male household had high access to credit as compared to females. The result is the same with (Takwa et al., 2018). Married



households had high access to credit. The institution has high self-assurances to provide credit for married households by assuming as married households were permanent settlers. In addition married households had high acceptance to form group for taking a loan. Majority of the respondents were Orthodox Christians. Muslims had low access to credit as compared to Orthodox Christians, this is because of their religious belief, they are discouraged to involve on interest bearing credit and borrowing.

Based on table 2, below the use of improved agricultural technologies is very crucial to increase agricultural production and productivity. The exercise of these improved technologies such as chemical fertilizer, improved seed, pesticides, irrigation, etc is very low in Ethiopia (CSA, 2017/18). When I clearly scrutinized the performance of the respondents in the company of access to credit, several of the respondents (83%) had no access to improved seed.

Table 2: Results of Descriptive Analysis of Discrete Explanatory Variables

Variables	X ² (CHI-SQUARE)	P-value
Religion of The Household Head	44.98	0.000***
Sexhh	34.25	0.000***
Marital Status	0.0170	0.896
Use of Improved Seed	17.20	0.000***
Access to Extension Service	13.55	0.000***
Use of Chemical Fertilizer	19.51	0.000***
Access to Save Money	165.02	0.000***
Participation of Off-Farm income generating activities	15.65	0.000***
Note: **Significant at 5% And *** Significant at 1% Probability Level of Significance.		

Source: Survey result, 2018

Government and NGOs were the most important suppliers of improved seed for those who had access for improved seed. Noticeably, when I saw the justification for not using improved seed were lack of information, costly, and lack of accessibility at needed time. The use of improved seeds still remains very low. Compared to the other inputs, it had not been widely practiced by smallholder farmers. The result is just about consistent with (CSA, 2017/18).



Eighty seven percent of sample households had access to extension service. Credit users' households (93 percent) had enhanced access to extension service as compared to non-credit user's households (77 percent). Extension service was extensively provided service in the area. On average, 93 percent of the respondents had access to chemical fertilizer, on this respect, both credit and non-credit users had just about equal access. Government (80 percent) and merchants (20 percent) were focal suppliers for chemical fertilizers. Households used chemical fertilizer ranging from 50 kg to 500 kg. Ninety two percent of the respondents applied 100 kg and below but 8 percent used more than 100 kg chemical fertilizer.

Concerning to employment and income generating activities, self-employment, farm labourer, non-farm labourer and migration to work in other areas were suggested as alternative areas of intervention to diversify their income sources. In addition, families used the income they generated from non-farm activities to buy fertilizer, food, clothes, to save money, to pay tax and loan from top to down. Regarding to saving behaviour of the respondents, 53 percent saved some amount of money or grain to use in case of emergency. The saving practices of credit users' were better than non-credit users' households.

Based on table 3, the mean age of sample household was more or less 51 years while the maximum and the minimum age observed was 70 and 28 years respectively. The average age of households who had access to credit was just about 51 year whereas for non-credit users, it was 53 year. According to ACSI (2004) loan is prohibited for older than 60 as a rule when ACSI was established. Now the maximum age is rearranged, and it depends on personal characteristics and repayment ability. Each and every respondent can read and write. It is rooted in the grade level of the respondents. Thus, the maximum grade level was 8 while the minimum was 1. Almost 98 percent of the respondents were found between grade 1 and 6. Non-credit users had better access to education as compared to credit user households. This is because when households find enhanced education, they will consider as there is salary growth, and they would be discouraged for borrowing. As well as, based on information received from key informants, when a household become educated, they leave the area and move to the town to get better job.



As far as the family size of the household is concerned, the maximum and the minimum family size were 7 and 2 respectively. The average family sizes for credit users' households were 4 while for non-credit users were 3. Therefore, the non-credit users had on average few families. This implied credit user family comprises more family members. Ninety eight percent of the respondents owned land. The maximum and minimum land size was 1.5 and 0.5 hectare for credit and non-credit users were 1.35 and 0.81 hectare respectively. On average both had 1.5 hectare land.

Table 3: Descriptive Analysis of Continuous Explanatory Variables

Variables	Mean Value		T-Value	P-Value
	Non-Credit Users	Credit Users		
Agehh	53.28	50.61	83.94	0.000***
Famsize	3.37	3.61	74.41	0.000***
EDU	2.11	1.7	27.29	0.000***
Landsize	1.2	1.05	70.12	0.000***
Oxen owned	1.38	1.64	0.4054	0.524
TLU	2.24	5.25	23.91	0.000***
Monthly Expenditure	668	1074	35.9	0.000***
Annual Expenditure	7427	13128	91.2	0.000***
Distance to Credit Institution	10.3	11	33.44	0.000***
Distance From Main Road	11.2	12.1	32.14	0.000***

Note: **Significant at 5% And *** Significant at 1% Probability Level of Significance.

Source: Survey result, 2018

Regarding to farm size, 95 percent of the respondents believed as their land was scarce to undertake agricultural activities to get agricultural production. From interview, now a time a household distributes the land for their boys and girls when they get married as a gift to start their living, it is compulsory. If they don't own land, they provide this kind of gift in the form of animals and money. Caused by this, the size of land is continuously declining.

About 85 percent of the respondents owned ox. Sixteen percent of credit users' households had no ox. Households had different kinds of farm animals consisting of goat, sheep, camel, cattle, back animals and poultry with a typical household maintained an average of 5.25



TLU. The minimum and maximum numbers of livestock holds were approximately 2 and 13 TLU respectively. The monthly expenses of credit users' households were superior to non-credit users' households. The averages spending of the respondent's maximally and minimally were 4000 birr and 200 birr which were also similar to credit users', but for non-credit users were 880 birr and 500 birr. Akin to monthly expenditure, the yearly month expenditure of credit user's household was higher than non-credit user's households.

On average, the distance between household home and ACSI office was 11 Km. Credit users' household walk off lengthy distance to acquire loan as compared to non-credit users. But in the case of distance to main road, non-credit users went long distance. In the study area, there was a problem of electricity, water and road. Concerning to visit by ACSI workers, credit users' had better access.

Access to Credit and Sources of Finance

Though ACSI had been established in 1988 at Amhara Regional level, it started in Gubalafto District in April, 2015. ACSI provides loan for rural households for agricultural and non-agricultural purposes depending upon borrower's interest. In the study area, there was no compulsion by ACSI to use the loan for only agricultural purpose; it depends on the business plan which was prepared by the borrowers' interest. It has its own lending criteria for borrowers. The most important one is poor household that is included under safety net program, a person whose age is greater than 18 years and households must live around one area and must be volunteers to work together.

According to the respondents, they were unwilling to participate at ACSI because of different reasons, the first one was due to high interest rate lay down by ACSI. The interest rate is increasing from time to time. For example before five years, it had been 13 percent, but currently it is 18 percent. The second reason was collateral requirement of the loan was very high. As it is known, rural households owned land, but this was not considered as collator for getting a loan even if they had ownership book. There was also transaction cost and set hurdles bureaucracy in the study area. The third reason was religious belief. The fourth reason was group lending.

The fifth reason was absence of time for relief for rural borrowers. Borrowers were forced to start paying the loan in the next time without having a break time at least one or two months, and for group the maximum loan was not as much as necessary to undertake



agricultural or non-agricultural activities. As it is known currently, there is inflation, so the loan size which is allocated by credit institution is not enough to undertake business. And the last one was lack of concern to engage in loan was the most important reason.

The supplies of credit for sample respondents were only from ACSI. Nevertheless, households took loan from ACSI, Rural Saving and Credit Cooperatives (RuSACCO) and Non-Governmental Organizations (NGOs) were also providing a loan in the study district. Households preferred ACSI because of the following reasons; the first one was ACSI provided a loan quickly. After fulfilling the necessary requirement, when borrowers submit an application letter with in 3 to 10 days, they would receive a loan. The second one was ACSI staff always monitored borrowers after taking the loan whether they put the money on appropriate purpose or not. Lastly, especially NGOs did not provide cash rather they would give loan in the form of kind. If there is misuse, ACSI takes serious measurement. The maximum amount of loan size was 50,000 birr and the minimum was 1000 birr. In between, the household could take a loan depending on their ability and preferences.

The form of lending was group lending; individually getting loan in rural area by ACSI was impracticable. It was considered as group collateral or guarantee. The group was formed from 3 to 10 numbers as a minimum and maximum. If the household is good borrower, he/she can get the maximum loan by three rounds based on his/her commitment to repay the loan. For rural borrowers, the maximum term was one year. But for urban borrowers, it was three years.

On the reverse, the problems of borrowers from the side of ACSI were mention as follows. The borrowers did not use the loan for the targeted objective. Firstly, it was expected from the borrowers for what purpose they would use the money. Then, borrowers would get the money. Sometimes this money might be used for other aims which were not known by ACSI. Secondly, borrowers might not disburse the loan on time. Thirdly, borrowers by simply becoming eager to get the loan, they would took the loan without fulfilling the necessary prerequisite. This had adverse effect on borrowers' final repayment ability. Lastly, borrowers might also transfer the loan for other person and change the work position which was not listed under the loan contract.

Household used the loan for agricultural production and activities like fattening ox, cow, goat and sheep, buying milk cow, producing honey, participating in market garden and etc.



Non- agricultural purposes were included like shop, cafe, retailing activities, barber and groceries.

Econometric Analysis

Logistic regression model was used to identify determinants of access to credit. It was conducted using STATA 14 with 250 number of observation. Twelve explanatory variables were selected to explain the dependent variable. Before going to the detail discussion on regression, diagnosis tests were conducted. The logistic model result confirmed the sex of the household head had negative and significant (at $p < 0.05$) relationship with household access to credit. Other variables being constant, as a household was administered by male, the odds of a female household head access to credit were higher than male household head by 0.61(at $p < 0.05$). The result is consistent with the works of (Kumar, 2015).

As hypothesized, educational attainment of household heads was found to be an important factor in determining access to credit, as educational attainment of household heads increases by one unit, the odds of a household access to credit decreases by a factor of 0.821 (at $p < 0.05$). The result is consistent with the works of (Ololade and Olagunju, 2013: Roberts, 2017).

Table 4: Econometric regression result of determinants of access to credit/ Logistic regression /

Credit	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
AgeHH	.958	.023	-1.78	.075	.914	1.004	*
SexHH	.16	.124	-2.37	.018	.035	.73	**
EduHH	.821	.081	-2.01	.045	.678	.995	**
Famsize	1.969	.451	2.96	.003	1.257	3.085	***
Landsize	3.432	1.272	3.33	.001	1.659	7.098	***
Dpratio	1.291	.31	1.06	.289	.806	2.067	
Amntfert	.952	.162	-0.29	.771	.682	1.327	
Tlu	1.105	.175	0.63	.53	.81	1.506	
Extension	8.934	7.583	2.58	.01	1.693	47.151	***
Dist	.958	.075	-0.54	.587	.821	1.118	
Nonfarminc	2.355	2.079	0.97	.332	.417	13.291	
Yincome	.999	0	-3.74	0	.999	1	***
Constant	3.859	8.495	0.61	.54	.052	288.581	



Mean dependent var	0.598	SD dependent var	0.491
Pseudo r-squared	0.291	Number of obs	249.000
Chi-square	64.069	Prob > chi2	0.000
Akaike crit. (AIC)	263.943	Bayesian crit. (BIC)	309.670
Log pseudolikelihood	-118.97155	Correctly predicted	75.1%
Sensitivity (access to credit)	85.91%		
Specificity (not have access to credit)	59.00%		
*** $p < .01$, ** $p < .05$, * $p < .1$			

Source: own survey result, 2018

The access to credit was found to be influenced by the family size of a household. The family size had a direct relationship with access to credit of a household, when a family member increased, the chance of borrowing increases. The logistic result revealed that as family size increased by one person, the odds of access to credit increased by a factor of 1.28, which is significant (at $p < 0.01$). The result is consistent with the research finding of (Yiorgos, 2019: Kumar, 2015).

The result also showed as there is a positive relationship between land size of a household and access to credit. This implies, the increase in the land size of a household also increased the access to credit. Since, majority of the farmers used the loan for fertilizer, as their land size increased they needed more fertilizer and then need more loan. The odd ratio implied as the land sizes of the household increased by one hectare the probability of a households' borrowing increased by 3.43 (at $p < 0.05$). The result is the similar with research output of (Kumar, 2020: and Gizachew, 2017).

Access to extension service affected households' access to credit positively. The result was similar as it was hypothesized. As a households' access to extension service increased, the probability of borrowing also increased. Simply, access to extension created demand for credit. The result revealed that as access to extension services increased by one unit, the odds of access to credit increased by a factor of 8.934, which is also significant (at $p < 0.01$). The result is consistent with the work of (Dzadze, 2012: Kiplimo, 2015).

Finally, total farm income affected access to credit negatively. The result was contrary with prior expectation. The possible explanation is as household income increases, their probability of borrowing decreases. The logistic result revealed that as total farm income



increased by one unit, the odds of access to credit decrease by a factor of 0.999, which is significant (at $p < 0.05$). But this result is similar with a research output of (Kiplimo, 2015).

CONCLUSION

This study tried to assess access to credit and its determinants at Gubalafto District of Amhara region in Ethiopia. The study found 60 percent of the respondents had access to credit offered by ACSI while 40 percent of the respondents didn't have access to credit. The study employed both descriptive and econometrics method of analysis. The descriptive analysis illustrated that male, married and Christian orthodox household head had greater access to credit than female, unmarried and Muslim household head respectively. It also showed that there was statistically difference in terms of age, family size, educational level and dependency ratio between credit users and non-credit users in the district.

The foremost livelihood of the household was farming. Non-credit users had small number of animals like ox, cow, sheep, goat and camels. Credit users had better access related to access to improved seed, extension service, chemical fertilizer and pesticides. Reversely non-credit users had better access with reference to non-farm income participation and distance from credit institutions. Majority of the respondents believed that the amount of credit was low and the interest rate was high. Borrowers were reluctant to participate at ACSI because of high interest rate lay down by ACSI; transaction cost, complicated bureaucracy, collateral requirement, religious belief and lack of concern to engage in loan.

The Econometric model with a necessary statistical diagnosis tests revealed that sex of the household, education level of the household, family size, land size of the household, access to extension service and yearly earned income were found to be significant in determining household access to credit. Among these variables sex of a household head, educational level of a household head and yearly income of a household affected access to credit negatively while land size, family size and access to extension service of a household affected access to credit positively. However, ages of a household, dependency ratio, amount fertilizer used in farm production, Tropical Livestock Units and Distance from credit institutions were found insignificant to determine the household's access to credit in the study area.

Based on the findings, the followings are the policy proposals.



Households are using the loan for other purposes which were not recognized by credit institutions and transfer for other people. The farmers should use the loan for the end purpose in order to reimburse the loan and become unbeaten in their economic objectives. Though one of the value and principles of ACSI was fully considering the economic setting of the society, now a day the societies are not comfortable with increasing interest rate. It is better the ACSI to reduce the interest rate that is not reflecting on the economic situation of the society.

Currently, ACSI is providing diversified service to the farmers, but the loan amount is not enough to borrowers. It is better to increase the loan amounts that consider the current inflation and the size of the borrowers.

When borrowers are asked to start paying the loan immediate month, they are frustrating and become not comfortable. It is better to ACSI to give time for relief that gives a break time for farmers.

As it is discussed from analysis part, the distance between the credit institution and the borrowers' house is long. This exposed farmers to disburse for food and transport cost. It is better to the government to open ACSI offices near to the farmers' residence.

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