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COLLEGE OF AGRICULTURE AND NATURAL RESOURCE

DEPARTMENT OF AGRICULTURAL ECONOMICS

DETERMINANTS THAT AFFECT AGRICULTURAL INPUT LOAN REPAYMENT IN CASE OF CHEHA WOREDA

A RESEARCH SUBMITTED TO DEPARTEMENT OF AGRICULTURAL ECONOMICS IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF THE BACHELOR OF SCIENCE(Bsc) DEGREE IN AGRICULTURAL ECONOMICS

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DECLARATION

Under signed declare that this research paper is my original work and it has not been presented for a degree in any other university, and all the materials required for the study has been acknowledged.

Student Name_____Signature_____ Date____/____/____

This study research paper has been submitted for examination with my approval as university adviser and Examiner.

Advisor Name _____ Singature_____Date___/___/____

Examiner Name_____ Signature_____Date___/___/___

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Abstract

Agricultural input loan is the most important source of income for small farmers to purchase agricultural input and bring changes in the economic development of farmers. Even though, the loan should be repaid according to agreement reached between borrower and lender, but the farmers' did not repay the loan on time. This study tries to identify determinants that affect agricultural input loan repayment of farmers in Cheha Woreda. Therefore, the major concern of the study was on identifying the major socio- economic and institutional factors that affect the loan repayment capacity of farmers in the Cheha Woreda. In this study, both primary and secondary data collected. Primary data collected by structured questionnaire from the sample of 100 household by multi stage sampling technique and secondary data collected from concerned organization in the study area. Analysis of the study conducted by descriptive statistics and econometrics models. Logistic regression results shows that variable such as education level, farm size and family size, are positively and significantly affects loan repayment of farmers, while, sex, age and distance from microfinance are significantly affects loan repayment of farmers negatively. Depending up on the analysis of the study,the recommendation were t*o improve agricultural input loan repayment in Cheha Woreda, it is essential to enhance education and training for farmers, ensuring they effectively utilize loans. Establishing microfinance institutions closer to communities should reduce logistical barriers. Additionally, creating farmer cooperatives can help stabilize prices and improve access to resources.

Keywords*: Determinants**, Agricultural input Loan repayment**, Logistic regression, and cross-sectional data.*

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ACRONYMS

ALR Agricultural loan repayment

AIDB Agricultural and Industrial Development Bank**.**

MFI Micro Finance Institution.

GDP Growth and Transformation plan.

NBE National Bank of Ethiopia.

LDC Less Developed Countries.

CBE Commercial Bank of Ethiopia.

LDC Least Development Country.

OLS Ordinary Least square.

SNNPR South Nations Nationalities and People Region.

MFI Micro Finance Institution.

DBE Development Bank of Ethiopia.

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CHAPTER ONE
1. INTRODUCTION

1.1. Background of the study

According to the World Bank, in 2021, the agriculture sector contributed 32.5% to Ethiopia's GDP, down from 36.7% in 2015/16. The sector continues to provide the majority of employment, with 65.2% of the total employed population working in agriculture as of 2021 (World Bank, 2023).

Regarding the challenges report by the Food and Agriculture Organization (FAO) in 2022 found that traditional farming practices, limited access to technology, and poor rural infrastructure are still major constraints facing the agricultural sector in Ethiopia. The report noted that only around 5% of the country's cultivable land is under irrigation, highlighting the need for increased investment in irrigation systems (FAO, 2022). Additionally, a study by the Ethiopian Agricultural Transformation Agency (ATA) in 2021 found that limited access to agricultural markets and poor market linkages continue to be a significant challenge for smallholder farmers in the country (ATA, 2021).

Access to agricultural input loans is a crucial component of supporting smallholder farmers and boosting agricultural productivity in developing countries (Abate & Rashid, 2021). However, high rates of loan default or non-repayment can limit the availability of these important credit sources and undermine the sustainability of agricultural finance programs (Bongomin et al., 2020). Understanding the key determinants that influence agricultural input loan repayment is essential for designing effective loan policies and interventions to promote inclusive and resilient agricultural development.

Recent studies have identified various socioeconomic, farm-level, and institutional factors that can impact smallholder farmers' loan repayment behaviors. These include the farmer's age, education level, household size, farm size, crop yields, access to extension services, group lending arrangements, and local market conditions (Magesa et al., 2020; Wongnaa & Awunyo-Vitor, 2022). However, the relative importance and interactions of

these determinants may vary across different agricultural regions and production systems.

This proposed study aims to conduct a comprehensive analysis of the determinants of agricultural input loan repayment among smallholder farmers by using the most up-to-date data from [year range, e.g. 2020-2023], the research will provide timely empirical evidence to guide the development of loan programs that are better tailored to the evolving needs and constraints faced by smallholder farmers. The findings can inform the design of credit policies, risk mitigation strategies, and farmer support services to improve loan repayment rates and ensure the long-term sustainability of agricultural input financing (Abafita & Kim, 2021; Haji & Geta, 2022).

This proposed study aims to investigate the primary factors that affect agricultural input loan repayment rates among smallholder farmers. Previous research has identified various socioeconomic, farm-level, and institutional variables that can influence loan repayment behavior, such as the farmer's age, education level, farm size, crop yields, access to extension services, and group lending arrangements (Jema, 2018; Omonona et al., 2010).

The study will build on the existing literature by incorporating the latest data and addressing the potential impacts of the COVID-19 pandemic on agricultural finance. Additionally, the research will explore the role of emerging factors, such as the adoption of digital technologies and climate change adaptation strategies, in influencing loan repayment behaviors (Bua & Nanteza, 2022; Nanteza et al., 2021).

1.2 Statement of the problem

An overwhelming majority of the world is poor live in the third world countries. Various approaches have been employed in alleviating poverty of which provision of credit that targets the poor is one. Gibbons, (1992) argues that the best way to do something about poverty is to let the people do their own thing. Nobody will have more motivation to change his situation than the suffer himself. It is generally accepted that credit, which put to productive use, results in good returns. But credit provision is such a risky business that, in addition to other reasons of varied nature, it

may involve fraudulent opportunistic behavior.

The lender in the financial system is at a disadvantage of information on the borrower's behavior. Mengistu,(1997). Although the performance of the MFIs in Ethiopia has been impressive since their establishment they are experiencing default problems as can be observed in their declining repayment rates. Hunte (1996) argues that default problems destroy lending capacity as the flow of repayment declines, transforming lenders into welfare agencies, instead of a viable financial institution. It incorrectly penalizes credit worthy borrowers whenever the collection mechanism is not efficient.

Loan default may also deny new applicants access to credit as the banks cash flow management problems argument in direct proportion to the increasing default problem. It is obvious that many rural credit schemes have sustained heavy losses because of poor loan collection and yet a lot more have been dependent on government subsidy to financially cover the losses they faced through loan default. But such dependence will not prove or helpful for sustainability. Mulatu, (2007).

The study will be focuses on Cheha Woreda. Farmers are characterized by subsistence and traditional farming as a result most farmers of this Woreda has no potential to purchase agricultural input by cash because, most farmers are small farmers. As a result government and private institution provide agricultural input loan to the farmers, but in most case the farmers of this Woreda does not repay loan on time to lenders due to different determinants such as social, economic and political problem .own survey, (2015). Even though, different researches are conducted by using different methodology regarding determinants that affect agricultural input loan repayment in different part of Ethiopia Such as economic variables such as farm size, low price agricultural output, educational level of farmers, Social variables such as, natural disaster, sex, age, family size and political variable like, lack of good governance. But the previous researchers cannot study using irrigation as the determinants and there is no similar study conducted in Cheha woreda. Therefore, this study would be add to irrigation as the determinants that affect agricultural input loan repayment of farmers in the study area (Cheha Woreda).

1.3 Research question

This study should be addressed the following question.

- What are the socio-cultural determinants that affect farmers' potential to repay loan on time?
- What are the economic and institutional determinants that affect agricultural input loan repayment of farmers?
- What are the source of agricultural loan repayment of the farmer?

1.4 Objective

1.4.1 General objective

The general objective of this study is to examine determinants that affect agricultural input loan repayment of farmers in Cheha Woreda.

1.4.2 Specific objective

- To identify/analyze the determinants that affect farmers' potential to repay loan on time in the study area.
- To assess the source of agricultural loan in the study area.

1.5 Significance of the Study

The significance of the study was to provide information about determinants that affect agricultural input loan repayment of famers in Cheha Woreda, to other researcher and policy makers of this Woreda. Additionally this study would high lights the behavior of farmers on agricultural input loan and repayment decision. So, in order to formulate successful strategy, this study would distinguish the causes, consequence and solutions of the farmers' of Cheha Woreda.

1.6 Scope of the Study

The scope of the study would carry out in Cheha woreda. The scope of the study would focuses on agricultural input loan repayment of farmers such as improved variety of seeds, DAP, Urea, and chemicals. Although sustainability of MFIs includes financial, economic, institutional and borrowers viability. Accordingly the study focuses on loan repayment performance, collection mechanism and impact (which are all part of the borrower viability aspect of sustainability) based on data obtained from woreda.

1.7. Limitation of the study

The paper was examined the causality nexus between financial development and economic growth. Due to the lack of thorough data for past years, the availability of data may have an impact on estimation methodology. However, attempts are made to resolve this issue using various data sources and estimating techniques, and also faced other obstacles like constraint of time, finance and data processing.

1.8. Organization of the paper

The study organized into five chapters. The first chapter deal with introduction, back ground of the study, statement of the problem, objective of the study, basic research questions, significance of the study, scope of the study, and organization of the study. The second chapter focuses on theoretical and empirical review of related literature and conceptual framework. The third chapter focuses on research methodology such as nature and source of the study, data type and analysis techniques, model specifications and estimation techniques. The Fourth chapter will be the empirical analysis and results. The last chapter is conclusion and recommendation.

2.CHAPTER TWO

2.1 THEORETICAL LITERATURE REVIEW

The objective of the review is access the finding of exalted study. So that, the gap can be identifies. The review touches published and unpublished source that will be presents as follows.

2.1.1 Definitions of term and concepts of Agricultural input loan.

It is a loan to farmers to acquire inputs during the planting season and its period is 11 months. The installment is low during the first 9 months, when farmers are planting and higher during the last two months, when crop is sold in the market.

Loan: - is borrowed money or commodity that you can use to purchase goods and services or use in production process as an input when you need them. It is the life blood of any business including agricultural sector. It is very difficult for business to survive and certainly grow without it especially for small farmers (NBE, 2016). It is an arrangement in which lenders give money or property to borrowers and agree to repay the property or money usually a long with the interest at future point in time.

Loan repayment: - the time that borrower or debt holder to repay his debt or loan. The minimum payment that has to be made in a period or penalties' levied for late payment (grow hill dictionary).

Default: - Defined as a failure to repay loan/ debt on time to the owners. On default: it may be defined as a payment of loan debt at the right time to the owner (dictionary definition).

Based on the duration of time it has classified in to three types of loan.

- **Short-term loan**; it take for one year only. Here the farmers take loans to produce output for one-year .The products such as maize, wheat, sorghum and teff etc.
- **Medium term loan**; it take for one year up to five year. Here more farmers are participating to take loan. Because; they can purchase the more factor of production (Like land).
- **Long-term loan**; it take for more than five year. The farmers are taken loan for produce more production by purchasing modernizes agricultural equipment due to long term of agricultural input loan .Almost all of the agricultural loan (credit) is short term nature,

which will have little impact on long-term investment and transformation of agriculture. Assefa, (2014).

2.2 Empirical Review of Literature

2.2.1 Need for agricultural input loan

Loan is the key input in every development program; this will particularly true for rural development. So long as sufficient loan is not provided to the development program of poor from either accumulated saving or capital market is necessary in financing many new technologies.(Beckman and faster, 2010). Agricultural input loan is the crucial input for the agricultural development. For agricultural stage of transformation, loan is an instrument that can make change possible with a minimum of social and physical losses (Brines and peer Hord (2015). Gonzalez – Vega, (2015) have under lined that the lined that the importance of loan facilities to small holders of LDC. Government of LDC and aid agency have extended large amount of money in the form of agricultural loan.

The motivation was the belief that the loan is an essential part of various input package that are prescribe as part of agricultural investment project designed to introduction modern technologies and thus stimulate change and growth in agriculture. Agricultural input loan is an important input to increased agricultural production and productivity through transformed traditional agricultural to modern agricultural that means the raise of agricultural output shall be attained through in organic fertilizer, improved seeds and pesticides'(MOA, 2014).

To receive these agricultural input loan the farmers are improved their productivity and change their life and produce moderate output for personal consumption and commercial purposes and etc. Studies undertaken in Ethiopia show that credit provision to small farmers increases their productivity and improves their standard of living. For instance, Assefa (2014) reported the need for the expansion of rural credit to all areas of the country.

Likewise, Birhanu (2012) and Getachew (2015) pointed out the need for agricultural credit to increase productivity and accelerate adaption rate. Generally, credit removes a financial constraint and helps accelerate the adoption of new technologies, increases productivity, and improves national and personal incomes. In addition, it constitutes an integral part of the process of commercialization of the rural economy and a convenient means of redressing rural poverty (MOA, 2014).

2.2.2 Determinants that Affect in Agriculture Loan Repayment Capacity of Farmers

Loan repayment capacity of small farmers has been variously investigates in literature. Different analytical techniques had been employed in the analyst to explain the effect of different explanatory variables on repayment capacity. Afolabi, (2010) have shown that non default, namely strategic default and non-default.

Due to negative economic shock strategic default and strategic default is associated to borrower will full discussion to default, even the benefiting business enterprises yield enough revenue to repay. Among the common reported individual specific socio – economic and demographic determinants that affect agricultural input loan is the borrower age and level of education (Oladebo, 2014). Gender equality and (Karim, 2009) are the major ones. Borrowers farming experience and gross farm income have be positively influence loan repayment. While large family size and non-farm experience have will be positive and negative influence on loan repayment of farmers respectively (Afolabi, 2010).

On the other hand according to Hawaii and Sharif (2012) access to method generally ensure that the poorer not richer people access to loan, specifically in the investigation of the loan repayment of farmers in hoarsen– revive province of lraqs found that, loan size and collateral values have significant effect on loan repayment, also interest charged on loan and number of installment for which loan is due for repayment has also affect loan repayment of farmers. Economic variables such as farm size, low price agricultural output, educational level of farmers. Social variables such as natural disaster, sex, age, family size and Political variable like, lack of good governance and the Institutional variables such as training, use of irrigation are major determinants of loan repayment.

2.2.3 Loan provision and Collection Mechanism in Ethiopia

Here we can categorize evolution of formal rural credit services in Ethiopia by three period of times; i.e. rural credit in Ethiopia before 1975, during the Derg period and after Derg regime. Following the creation of the Ministry of Agriculture in 1943, the Agricultural Bank of Ethiopia was established to accelerate agricultural development by assisting small landholders whose farms had been devastated during the Italian occupation through loans for purchase of seeds, livestock and implements and to repair or reconstruct their homes and farm buildings (Tesfaye, 2014).

Regarding rural finance, the share of agriculture reflected the importance attached to it in the Plan. Subsistence and large-scale and mechanized agriculture together were to receive about half of the bank credit. Subsistence agriculture was transformed through:-

(a) The introduction of improved tools and implements, modern techniques, and better seeds;

(b) Credit, price and tax policies; and

(c) Land reform and agricultural services (Assefa, 2014).

High collateral as high as 200% of the loan, mainly in the form of real property and machinery, guarantor requirements, in the face of widespread tenancy, land title problems e.g. communal land, rest system, etc. proved to be the major hindrances of the total DBE loans disbursed during 1951-69, only 42 per cent went to agriculture, of which small farmers received only 7.5 per cent.

The implication of these on peasant farmer's credit access is clear. While the share of agriculture in total credit during 1970/71-74/75 was high, averaging about 65 per cent, peasant farmers did not benefit much. It mainly went to dairy development projects, large farmers, co-operatives of commercial farmers (Tesfaye, 2014).

Overall, the extent of exclusion was well recognized by the AIDB board so much so that in 1974 it decided to introduce a small farmers credit program on pilot basis but was not implemented as it was overtaken by events of the revolution .After the fall of Emperor Hailesilassie government, the financial system in Ethiopia was nationalized and restructured based on the 1976 Banking Law.The credit policy was geared towards the overall policy of the country's centralized economic management. Credit policy will gives absolute priority to the socialized sector public enterprises, state farms and cooperatives. Loans and advances by borrowing institutions over the ten year period between 1981 and 1990 show that on average the government sector took 36.4% of the total, while50.3%wenttopublicenterprises and the private sector's share was only 8.3% of the total loans and advances made by the banking system during the period.

More than 89 percent of agricultural loans went to state farms while the rest went to agricultural co-operatives, with the private peasant sector receiving negligible share. Therefore, the outcome with regard to reaching small rural borrowers with financial services was disappointing both

during the Imperial and Derg regimes this is evident from the amount of rural credit that went to the peasant sector.

Considering the large number of rural population, the size of land under cultivation and the demand for credit, the volume of loan extended to this sector will insignificant. Following the fall of Derg regime, Ethiopia has followed free market economy, which advocates financial liberalization. Both economic theory and practical experience suggest that financial liberalization can stimulate economic development. Financial liberalization in Ethiopia began at the end of 1992.

Lending rates that were between 4.5 and 9.5% were raised to 11-15% depending on the sector until September 1994.Discrimination of credit access and interest rates by type of ownership (i.e. between state owned enterprises, cooperatives and private firms) was eliminated Banks have been decentralizing loan decision making in order to reduce transaction costs of borrowing and reducing screening hence transaction costs of lending.

The lending approaches of banks to target beneficiaries could be both a direct type and a two-tier system. The direct type is in which the Bank extends credit directly to the end user. This cans an individual person or organization such as cooperatives, government or private enterprises, which have legal entity. In the two-tier approach, the Bank transfers its financial resources to end users through other bodies such as cooperatives and peasant associations. Repayment of the borrowed loan,

In the case of rural Ethiopia, regional governments act as intermediaries' between banks and farmers. These governments use their federally allocated budget as collateral to borrow from banks and lend these funds to farmers for the purchase of agricultural inputs. This procedure has enabled banks to lend a great deal of money to farmers. Nevertheless, there have been cases of default, which have necessitated repayment out of the budget allocations of the regional administrations

As compared to other economic sectors the share of agricultural sector in the total credit disbursed by the banks has continued to be marginal. For instance, the share of agriculture in the total credit disbursed between 1991/92 and 1997/98 has only been14.7%, while domestic trade have 32.2% and industry 13.2%.

Recently, the share of agricultural credit stagnated at around 16% and never exceeded 19% of the total credit disbursed. In addition, it is believes that was almost all of the agricultural credit is of short term nature, which will have little impact on long-term investment and transformation of agriculture. (Assefa, 2012).

At present, local community participation in screening borrowers and filtering genuine defaulter is minimal. The authorities and the leaders of MPCs have no objective means of assessing the extent of crop loss. (Mullet, 2015).

Agricultural input loan is provided in both cash and kind in commercial bank of Ethiopia has been the major financier of input credit to small holder farmers' since 1994 to 1995. From 1994 to 1996 credit were given to farms through their cooperative without the regional government providing guarantee for full loan refunding.

As of 1996 the commercial bank of Ethiopia to sign loan contract with the regional government directly due to the lack of collateral held by rural households and to guarantee loan repayment. Borrowers farmer pay 10-5% interest rate on the input loan. The repayment of loan is immediately after harvest is done. If farmers fail to repay loan on the time, administration enforcement start to operate (CBE, 2015).

Determinant loan repayments of agricultural input are a lot. Placebo (2014)explained socio – economic determinants like amount of loan paid, loan collected spent on agricultural production, net farm income, age of farmers, farm size cultivate, farming experience with credit use and farmers in Ogbomosho Nigeria. Among this determinants, amount of loan obtained by farmers, year of experience with credit use and level of education major determinants that affect loan repayment positively.

Koopahi, (2011) found that the use of machinery, Length of repayment period, bank supervision on the use of loan will have significant positive impact; on the other hand incidence of natural disaster, low level of education and waiting time for loan reception has significant negative impact on repayment of agricultural input loan.

In Ethiopia default may rise from determinants such as the inability of borrowers to repay due to crop failure, unwillingness of borrowers to repay, problem of loan management and utilization difficulties are the major ones(CBE,2016).

Most report show that innovation and management practice, availability and accessibility of tractors, crop failure and poverty level are other determinants that affect agricultural input loan repayment (Afolabi, 2010). From above empirical literature major determinants that affect loan repayment are conducted on different socio-economic, cultural and demographic settings.) According to the above researchers, the determinants that affect agricultural input loan repayment of farmers are economic variables such as farm size, low price agricultural output, educational level of farmers, Social variables such as, natural disaster, sex, age, family size and political variable like, lack of good governance. But, the above researchers cannot study use of irrigation as the determinants that affect agricultural input loan repayment of farmers. Therefore, this study would be added to use irrigation as the determinants that affect agricultural input loan repayment of farmers in the study area.

2.4 Conceptual frame work

The conceptual frame work diagram of this study is present as follow figure:

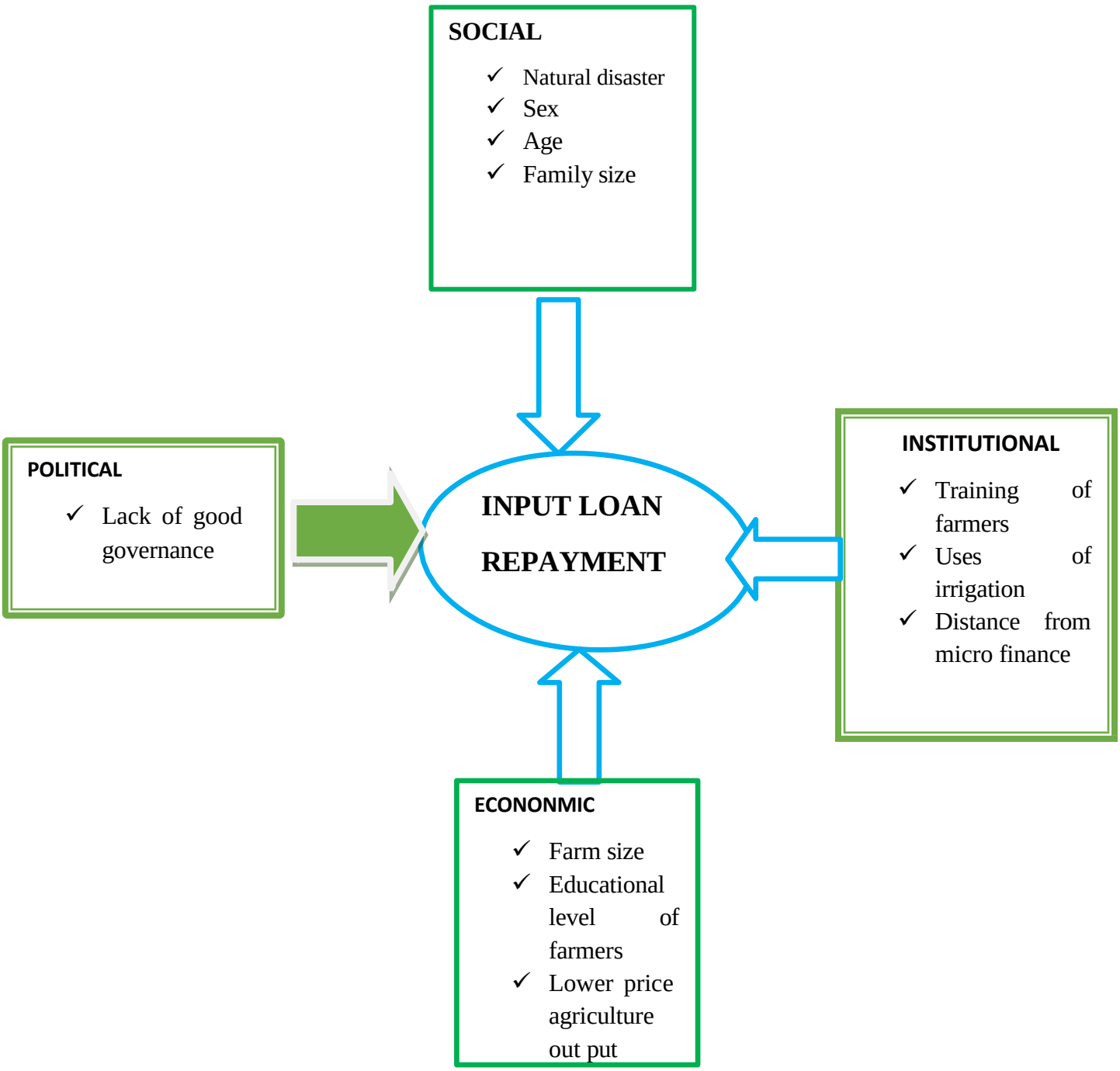

Figure 2.1 Conceptual frame works of determinants that affect agricultural input loan repayment.
Source; own synthesis from litrature

3.CHAPTER THREE

3.1 METHODOLOGY OF THE STUDY

3.1.1 Description of Study Area

The study would be conducts in the Cheha woreda, which is one of the Guraghe Zone, Central Ethiopia Regional State, which located at 188km South of Addis Ababa on the way to Wolkite town, the capital of the zone, its geographical coordinates are 8° 00' 18.9" to 8^0 15’ 28.53” North, and 37° 35' 46.48" to 38^0 03’ 59.59” East. The total area cover is 44,072 hectares and its altitude ranges from 1200m a.s.l in the lowlands and 2600m a.s.lin the highlands. The annual rainfall of the area ranges from 800 to 1200mm. Enemor Ener woreda borders in the South, Oromia region in the West, Ezha woreda in the East, Gumer and Geta in the Southeast, and Wabe river, which separates it from Abeshege, and Kebena in the North. The woreda constitutes 40 rural Kebeles (the lowest administrative unit) of which 39 are rural and 1 is rural town. According to census of 2007 the district population 178,250 of whom 87,042 were Male and 91,208 Female; and 168,750 of its population was rural dwellers and 9500 were urban dwellers.

3.2 Data Source

The study would use both primary and secondary data to gather the required information for achieving the stipulated objectives. The primary data would be collects by using questionnaire and interview methods.

The study would undertake through qualitative and quantitative research methodologies. In order to collect primary data, the study would use survey questionnaire the specific aspects on which data collection would be include yield produced per hectare, major agricultural inputs that the respondents would uses etc. The study would also uses to collects secondary data that are relevant to the study from the report of the Woreda bureau of agriculture and rural development and from other related theoretical article.

3.2.1 Method of Data collection

For this study, the primary data would collects through interview and structured questionnaires of sample respondents, because the information would be from literate and illiterate responses, but secondary data collect from both published and unpublished documents.

3.3 Sampling Techniques

The sampling technique that would be employed is multi stage sampling technique, because, this sampling technique would be applies more than one stage. At first stage Cheha woreda would be selects from all Guraghe zone randomly. In the second stage from 40 Kebeles, 4 Kebeles would be selects. In the third stage from four Kebeles, 100 respondents was selects by using simple random sampling technique from 990 total populations who were taking loan in four Kebeles by applying of Yamane formula.

3.3.1 Sample size

It was not applicable enough to cover the cost of research to study on all elements of the population due to economically costly, require large number of time, and large number of human resources. To study all entries of the population, the study would conduct on select samples. In Cheha woreda there are about 15,877 households, from these 6800 are women and 9077 are men, from this total of 15,877 household 2,090 household take loans for agricultural purpose as a woreda and 526 household take loans for agricultural purpose in four Kebeles.

The respondent would be deciding by using Yamane (1967). Sample size would be computes by taking 95% confidence interval, 0.5 degree of viability and 9% degree of precession.

From four Keble 526 household are take loan for agricultural purpose in 2024.

$$n=\frac{N}{1+N[R]^2}, = \frac{526}{1+526(0.09)^2,} = 100$$

Where, n sample size

e= level of precession equal to 9%

N = number of household take loan for agricultural purpose in k^{th} Kebeles

Table 3.1 Summary of sample size determination in selected Keble

Kebeles	Number of H/H lone taken	Number of size of H/H loan taken
Endebira	152	26
Wodiro	119	27
Yegrar	153	23
Yefektrek	102	24
Total	526	100

Source ;(own survey: 2024)

3.4 Method of Data Analysis

To conduct the study, both descriptive and econometric methods of data analysis was uses. In the descriptive part, the study would be used table and percentage to describe the given data. In the econometrics part the dependent variables was dummy variable the study would be used logit model from binary response model. Other types of binary response model such as linear probability model has limitation that the value ranges between zero and one (Gujarat4 edition, 2004).

3.5 Econometric model specification of the study

Binary choice model assume that individual were faced with choice between two alternatives. Thus the choice was the qualitative choice with given a set of attributes would make choice (if farmers repay loan on time or not to repay loan on time).Following green and Guajarati (2010) the logit model for the determinant that affects repayment of agricultural input loan specified as follows. The dependent variable was dummy variables, which take value 0 or 1 depending on whether or not farmers repay loan on time. However, the explanatory variables were both continuous and dummy variable.

3.6 Agricultural input loan repayment

The loan repayment equation was specifies based on the assumption that the decision of the i^{th} borrower whether to repay loan in full or not depends on an unobservable utility index, ui explained by a set of independent variables. This utility index, which indicates that the

Probability of repaying loan in full would be greater if its value is larger, could be defined by a Regression relationship as: Ui= 'Xi + I Where ui = utility index, =Vector of parameters, Xi= Vector of explanatory variables (Maddala, 1983).

The reason why we used a utility index for the analysis of repayment performance is that, under normal circumstances, a borrower repays if he/she derives benefits from repaying. For example, if a borrower expects to get another round of loan, he/she would be replayed the current loan (Mengistu, 1997).In order to relate this unobservable utility index (precisely a utility was derive from repaying) to the decision of repaying loan in full, we assume that.

ALR=1, if Ui>o (borrower repay loan in full); or

ALR=O, if Ui =O (borrower did not repay loan in full).

Where ALR is Agricultural input loan repayment for the i^{th} borrowing that Ui> 0 can be compute as:

Pi=Prob (Ui>0) = F (Ui) = F (Xi).

Hence the likelihood function (the joint probability) is given by: (Maddala, 1983).

L= ALR= 1Pi, ALRi=0 (1-Pi). Since we do not have actual repayment rates.

3.7 Model Description

The dependent variable in logistic regression was usually dichotomous, the dependent variable could take the value “1” with probability of success (satisfactory)or the value “0” with probability of failure (not satisfactory). The model for logistic regression analysis assumes that the outcome variable Y is categorical, for example, binary or dichotomous in this study, the binary logistic model used to analyze whether the performance of the ALR was satisfactory or not. The dependent variable in this case was dummy variable, which take the Value of (1) for satisfactory performance by ALRs, and (0) otherwise. This model allows one to predict out comes, from set of variables may be continuous, discrete, and dichotomous or mix of any of these.

The terminology binary logistic regression analysis the odd of success was defined as to be the ratio of the probability of success to the probability of failure.

$$Logit(P_i) = Log\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \ldots\ldots\ldots + \beta_k X_{ki}.$$

Where, are the model parameters and for this study was the dependent and explanatory variables define as:

Yi=1 If pay loan

0 other wise

Moreover, other explanatory variables included in the study based on the data collects from the respondent. Making some arrangements of above model or relation can be written as:-

$$P_i = P(Y_i = 1 / x_1, x_2 \ldots x_k) = \frac{e^{\eta_i}}{1 + e^{\eta_i}}$$ (logistic regression function)

Where, $\eta_i = \sum_{i=0}^{K} B_i X_i$ and X_0=1; Odd ratio, the probability of an event happening is $\left(\frac{P_i}{1-P_i}\right)$ For the i^{th} event as a success. That is:-

$$Odd(Y_i = 1) = \left(\frac{P_i}{1-P_i}\right) = e^{\eta_i}$$, i= 1, 2…..k

After finding the odd ratio the interpretation will be applies for each explanatory variables with respect to the obtain odd ratio that is e^{bi} only whether a borrower has repay his loan or not.

This model was specifying as:

ALR = f (SX, AG, EL, FS, DMFI, UI, TR, ND, DLOT, FRMS)

$ALR = \beta o + \beta 1 dummyfemaleSX + \beta 2AG + \beta 3EL + \beta 4FS + \beta 5DMFI + \beta 6dummynUI + \beta 7dummyntTR + \beta 8dummynND + \beta 9dummynDLOT + \beta 10FRMS + ui$myntTR

$Y = \beta_{o+}\beta 1x1+\beta 2x2+\beta 3x3+\beta 4x4+\beta 5X5+\beta 6X6+\beta 7X7+\beta 8X8+\beta 9X9+\beta 10X10+ui.$

Below are given the list of the variables together with their definitions.

1. ALR=Agricultural loan repayment, ALR=1 if fully repaid, zero otherwise. No fully repaid is base group

2. AGHH= Age of Households.

3. SXHH= Sex of Households.

0 if male, 1 otherwise, female is base group

4. EL= Educational Level of borrowers (Households).

5. FS= Family size.

6. TR= Training. 1 if take it, 0 otherwise not use it is base group.

7. DMFI= Distance from micro finance institution.

8. FRMS= Farm Size.

9. ND = Natural disaster.

1 if disease, 0 otherwise, no disease is base group

10. UI = Irrigation use.

1 if they were used it, 0 otherwise no use is base group

11. DLOT=Distribution of Loan on Time.

1 if distributed on time, 0 otherwise no distributed is base group

Description of the explanatory variables together with their expect signs is given below:

1. Age: Vigano, (1993) noted that with increase in age, it is usually expected that borrowers get more stability and experience. So we expect this variable to have a positive impact on repayment performance. However, since as people get older, their ability to effectively use finance and generate income declines, the variable could also have a negative impact. It may also have a non-linear relationship with loan repayment, where up to a certain level of age loan there is a positive relationship, but beyond that age the relationship changes to either negative or becomes more or less constant

2. Sex of Borrower: There is a belief among many Microfinance specialists that female are better payers than male borrowers, taking into consideration their being more Entrepreneurial that results from assuming more responsibilities in the internal affairs of a Household. (Vigano, 1993). Also Khanker(1995) explains that loan recovery rates have been higher for women than for men in the case of Grameen Bank. But some Researchers have found the opposite result. So the sign of this Variable is negative expected.

3. Educational Level of Borrower: This variable is expected to have a positive impact on repayment performance in general. Considering normal circumstances, a more educated borrower is expected to use the loan effectively as compared to a less educated one. In this case it expected a positive sign for the variable. Koopahi, (2011).

4. Distribution loan on time: if loan is disbursed in time, it is unlikely that it will be diverted to non-intended purposes. Johnson and Rogaly, (1997) noted that timeliness of loan disbursement is important when loans are used for seasonal activities such as agriculture. They argued that complicated appraisal and approval procedures, which might delay disbursement, influence a program of seasonal loans for farmers who use to buy inputs. Further that this could in turn worsen the prospects of repayment by diverting loan to non-intended purpose. In such cases a positive sign was expected.

5. Natural Disaster: Natural distaste brought predictable on agricultural output tend to define due to bad climate, pests, diseases they are most of the time subject to bad climate, lack of rain and etc. this thing affected agricultural output to declines and negative sign expected. Koopahi, (2011).

6. Training*:* It has positive relationship with the probability of loan repayment. The train farmers know how to use loan for allocating for different agricultural production. Placebo (2014).

7. Family Size: Large family size increase labor force that work on farm and participate on nonfarm activates that generate income and they should be paid loan repayment due to participated in different activities. Therefore, it can affect positively the loan repayment. Afolabi, (2010).

8. Distance from microfinance: It has negative relationship with the probability of loan repayment, implying that of loan repayment decrease with increase in distance.

This can for the fact that household who is far from micro finance has less probability to repay loan on time. Assefa. A, (2014).

9. Irrigation use: the major means of increasing agricultural productivity is using irrigation in farming activity and it is positively affected loan repayment. Afolabi, (2010).

10. Farm size as a farm size increase the willingness of farmers to receive agricultural input loan is raise and due to that reason it shows positive sign expected .Placebo (2014).

CHAPTER FOUR

2. DATA ANALYSES AND DISCUSSION

This chapter summarizes the major findings of the study. Both descriptive statistics and econometrics analysis were used to analyze the primary data. Descriptive statistics employed to describe the socio-demographic characteristics of sample households. As it have mentioned in the methodology part, 100 respondents selected as representative of target population. Econometrics analysis used to identify Determinants that Affect Agricultural Input Loan Repayment.

4.1 Descriptive Analyses of Data

In this part, there result of descriptive analysis is reported that are based on cross sectional data collected from Cheha woreda. The survey data were used to describe demographic, socio economics, and institutional characteristics of the sampled respondents.

4.1.1 Demographic characteristics of respondents and loan repayment

4.1.1.1 Sex compassion of respondents and loan repayment

Table 4.1 sex composition

Sex of respondents	Repaid	Not Repaid	Total
Male	42	15	57
Female	30	13	43
Total	72	28	100

Source: own survey; 2024

The table showed loan repayment data by gender for 100 respondents. Among 57 males, 42 repaid loans while 15 not repaid. Of 43 females, 30 repaid and 13 not repaid. Overall, 72 repaid and 28 did not. Males had a slightly higher repayment rate (73.7%) than females (69.8%).The data indicated a minor gender disparity, with males marginally more likely to repay. However, the difference was small, suggesting sex had limited impact on repayment behavior. Default rates were similar for both groups, with roughly 1 in 4 borrowers failing to repay. Due to this reason, it affected negatively with loan repayment.

4.1.1.2 Age composition of respondents and loan repayment

Table 4.2 age composition

Age of respondents	Repaid	Not Repaid	Total
Age 15-30	17	8	25
Between 31- 45	35	10	45
Between 46-64	13	7	20
Above 65	7	3	10
Total	72	28	100

Source: own survey; 2024

The table presented loan repayment data by age group for 100 respondents. Among those aged 15-30, 17 repaid loans while 8 not repaid. The 31-45 age group had the highest repayment rate (35 repaid, 10 not repaid). Older groups showed lower repayment numbers: 13 repaid and 7 not repaid in the 46-64 bracket, while only 7 repaid and 3 not repaid among those above 65. Overall, 72 repaid and 28 not repaid. The 31-45 age group demonstrated the strongest repayment behavior, suggesting middle-aged borrowers were the most reliable. Repayment rates declined with age, though sample sizes varied across groups.it affect negatively loan repayment.

4.1.1.3 Marital status of respondents and loan repayment

Table 4.3 marital status of responds

Marital status	Frequency	Percentage
Unmarried	8	8%
Married	73	73%
Divorced	10	10%
Widow	9	9%
Total	100	100%

Source: own survey; 2024

Regarding on marital status as shown on the above table 4.3, among the total respondent 8% of respondents were unmarried, 73% were married, 10% were divorced and 9% of them were widowed. This figure depicted that from the total respondents 73% were married. However, marital status also has its positive impact by married side and negative impact by unmarried side on loan repayment. Because the expenditure of unmarried and married households is not the same. And also the married respondents were had family size and more hectares of land than unmarried respondents. They could be paid their repayment by participated on different activities to their payments due to have high family size and more farm sizes than unmarried respondents.

4.1.1.4 Family size of respondents and loan repayment

Table 4.4 Family size of respondents stay on out of agricultural products

Family size of respondent	Frequency	Percentage
One family size	4	4%
Between 2-3	3	3%
Between 4-6	33	33%
Between 7-10	60	60%
Total	100	100%

Source: own survey; 2024

As survey of data indicated that in the above table 4.4 revealed that, among the total respondent, 4% of respondents have one family size. 3% of respondents have between 2-3 family sizes, 33% of respondents have 4-6 family sizes and 60% of respondents' have7-10 family sizes. Large family size increase labor force that work on farm and participate on nonfarm activates that generate income and they should be paid loan repayment due to participated in different activities. Therefore, it can affect positively the loan repayment.

4.1.1.5 Educational level of respondents and loan repayment

Table 4.5 Educational level of respondents

Education level	Frequency	Percentage
Illiterate	34	34%
Primary	27	27%
Secondary	17	17%
Diploma	18	18%
Degree	2	2%
Certificate	2	2%
Total	100	100%

Source: own survey; 2024

As survey of data indicated that, in the table above 4.5, from the total respondents 34% of the respondents were illiterate, 27% of the respondent attained primary school, 17%of the respondents attained secondary school, 18% percent of respondents get diploma,2% degree and 2%of of the respondents were certificate. This survey revealed that, more than half of respondents were illiterate, from this, we can said that when farmers have low level of education, they could not know how to use different technology, modern farming tools.so lack of education have affected negatively agricultural production which in turn repayment of agricultural input loan**.**

4.1.2 Socio Economic and Institutional Characteristics of Respondents

4.1.2.1 Land size ownership status of respondents and loan repayment

Table 4.6 Agricultural land ownership

Land ownership	Frequency	Percentage
Yes	75	75%
No	25	25%
Total	100	100%

Source: own survey; 2024

The survey result presented on the above table 4.6 show that from the total respondents, 75% of respondents have own land, and 25% of respondents have not own land. The result shows more of the respondents have own land. So that as the more of land owners increase the loan payments also increase and it has positive impact.

4.1.2.2 Land size ownership status of respondents and loan repayment

Table 4.7 land size ownership status of respondents

Land size of hectare	Frequency	Percentage
1-2 hectare	13	13%
3 hectare	5	5%
4 hectare	24	24%
>5 hectare	58	58%
T0tal	100	100%

Source: own survey; 2024

The survey result presented on the above table 4.7 show that, from the total respondents, 13%of respondents have 1-2 hectares, 5% of respondents have 3 hectares, 24% of respondents have 4 hectares and 58% of respondents have more than 5 hectares. The result indicated that more than

half of the respondents have more than 5 hectares of land and it have positive impact on loan repayment. Because, as increase in farm size the loan repayment also increase directly.

4.1.2.3 Sources of loan inputs and loan repayment

Table 4.8 Sources of loans of respondents

Sources of loans	Frequency	Percentage
Farm association	53	53%
NGO	32	32%
Government	15	15%
Total	100	100%

Source: own survey; 2024

As the above table 4.8, out of the total respondents, 53% of respondents taken loan from the farm association, 32% of the respondents take loan from NGO, and 15% of the respondents take loan from government. As the survey result indicated that, around half of the respondent had taken loan from Farm association.

4.1.2.4 Distribution of Loan on Time to Farmers and loan repayment

Table 4.9 distribution of loan on time to farmers

Did you received loan on time	Repaid	Not repaid	Total
Yes	58	15	73
No	14	13	27
Total	72	28	100

Source: own survey; 2024

The table displayed data on whether 100 loan recipients received funds on time. A majority (58 respondents) reported timely loan disbursement, while 15 did not (total 73). Conversely, 14 recipients received delayed loans, and 13 experienced both delays and other issues. Overall, 72 received loans (either on time or late), while 28 faced problems. The data revealed that most

borrowers (73%) got their loans, with delays affecting only 19% (14 out of 73). However, a notable portion (13%) reported unresolved issues. Timely disbursement was common, but delays and complications still impacted a significant minority of recipients.it affected positively agricultural input loan repayment.

4.1.2.5 Interest payment and loan repayment and loan repayment

Interest is a reward for capital. Different source of credit institution provide loan to borrower by making contractual agreement and after period, the borrowers repaid loan according to the agreement so at this time farmers repaid plus interest.

Table 4.10 interest payment of sampled respondents

Interest payment	Frequency	Percentage
Very high	33	33%
High	43	43%
Moderate	24	24%
Low	0	0%
Total	100	100%

Source: own survey; 2024

In the table 4.10, from the total respondents, 33% said about interest payment on loan very high, 43% of the respondents said about interest payment on loan high, and 24% of the respondent said about interest payment on loan moderate. The survey indicated that around 76% of the respondent said about interest payment high and very high, therefore based on the result we can said that, interest rate affects negatively repayment of agricultural input loan.

4.1.2.5 Price of Agricultural product and loan repayment

Table 4.11 Price of agricultural product

Is price agricultural product is low?	Frequency	Percentage
Yes	68	68%
No	32	32%
Total	100	100%

Source: own survey; 2024

Table 4.11, indicated that, from the total respondents,68%of the respondent answered that they faced low price for their agricultural product at harvest period, 32% of the respondent did not faced low price of agricultural product. The reason for low price of agricultural product at harvest period is lack of adequate market, excess supply of agricultural product at harvest period and in addition to these as respondent said the credit institution collected loan at the time of harvest period. So if price of agricultural output is low at harvest period. So respondents were could not had the sense of loan repayment, due to shortage of their income and it was affected negatively with loan repayment.

4.1.2.6 Natural Disaster and loan repayment

Natural distaste brought unpredictable on agricultural output tend to define due to bad climate, pests, disease and others as survey of the woreda office of agricultural development show farmers of Cheha woreda are dependent on natural rain so they are most of the time subject to bad climate, lack of rain and etc., this thing affect agricultural output to decline.

Table 4.12 sample of respondent faced natural disaster

Did you face natural disaster on the last one year?	Repaid	Not Repaid	Total
Yes	34	26	60
No	10	30	40
Total	44	56	100

Source: own survey; 2024

The table compared loan repayment against natural disaster exposure among 100 respondents. Of those who faced disasters (60), 34 repaid while 26 not repaid. Among unaffected borrowers (40), only 10 repaid while 30 not repaid. Surprisingly, the repayment rate was higher for disaster-affected borrowers (56.7%) than unaffected ones (25%). This unexpected pattern suggested disasters didn't necessarily hinder repayment and may have motivated some borrowers to prioritize loans. However, overall defaults (56) exceeded repayments (44), indicating widespread repayment challenges regardless of disaster exposure. therefore, it affected negatively the loan repayment.

4.1.2.7 Types of natural disasters faced by respondents and loan repayment

Table 4.13 Types of natural disasters faced by respondents

Types of natural disaster	Frequency	Percentage
Drought	19	31.67%
Acidic rain fall	6	10%
Fungi	10	16.67%
Death of animals	13	21.67%
Parent sickness	12	20%
Total	60	100%

Source: own survey; 2024

Regarding on table 4.13, from the total respondents 31.67% of there were faced by drought, 10% were faced by acidic rainfall, 16.67% faced by fungi, 21.67 of there were faced by death of animals and 20% of there were faced by parent sickness. As survey indicated that more of the respondents respectively faced by drought, Death of animals, Parent sickness, Fungi and Acidic rain fall were decrease agricultural production and it affected negatively the loan repayment.

4.1.2.8 The importance of using irrigation and loan repayment

Now the study the major means of increasing agricultural productivity is using irrigation in farming activity. In this woreda more of the farmers were used irrigation service as a result they started to produce twice year and farm income also increase and they initiate to work hard and take appropriate input loan to increase productivity and it is positively affected loan repayment.

Table 4.14 use of irrigation by sample of farmers

Did you use irrigation?	Repaid	Not Repaid	Total
Yes	28	12	40
No	16	44	60
Total	44	56	100

Source: own survey; 2024

The table analyzed loan repayment patterns based on irrigation use among 100 respondents. Farmers who used irrigation showed significantly better repayment rates, with 28 repaying and only 12 not repaid (70% repayment rate). In contrast, non-irrigating farmers struggled more, with just 16 repaying versus 44 defaulting (26.7% repayment rate). The data strongly suggested irrigation use correlated with higher repayment likelihood, possibly due to more stable

agricultural output. Overall defaults (56) exceeded repayments (44), but irrigators accounted for nearly two-thirds of successful repayments despite representing just 40% of borrowers. This highlighted irrigation's potential role in improving loan repayment performance.it was positively affected loan repayment.

4.1.2.9 the payments of loans from income get from using irrigation and loan repayment

Table 4.15 the payments of loans from income get from using irrigation

Paid from Using irrigation	Frequency	Percentage
Yes	44	66.67%
No	22	33.33%
Total	66	100%

Source: own survey; 2024

As show on the above table 4.15, from the total respondents 66.67% of the respondents were paid their payments which income get from using irrigation, and 33.33% of the respondents were paid their payments which income get from other activities. Here it has positive relation with loan repayment.

4.1.2.10 the payments of loans on time and loan repayment

Table 4.16 the payments of loans on time

Paid loan on time	Frequency	Percentage
Yes	36	36%
No	64	64%
Total	100	100%

Source: own survey; 2024

As the result of table 4.16, from the total respondents 36% of the respondents were paid their payments after used the inputs and 64% of the respondents were no**t** paid their payments after

used the inputs. Fail to pay loan is due religion case **;** specially Muslim followers around 80% out of the respondents said, our religion is not allowed to pay interest rate with principal, so more of us have no sense to paid the payments with interest rate on time. It could be more negatively affected loan repayment.

4.1.2.11Training of sample respondents by lenders and loan repayment

Table 4.17 Training of sample farmers

Did you get training?	Repaid	Not Repaid	Total
Yes	22	18	40
No	22	38	60
Total	44	56	100

Source: own survey; 2024

The table showed loan repayment patterns based on training received. Among 40 trained borrowers, 22 repaid while 18 not repaid (55% repayment rate). Untrained borrowers (60) had the same number of repayments (22) but nearly double the non repayment (38), yielding a lower 36.7% repayment rate. While total repayments equaled 44 for both groups, trained borrowers demonstrated better repayment performance relative to their group size. The data suggested training may have improved repayment behavior, as the default rate was significantly higher among untrained individuals.So, it affected positively loan repayment.

4.1.2.11 Distance from the lending institution of sample respondents and loan repayment

Table 4.18 Distance from Micro finance of farmers

Distance in km	Repaid	Not Repaid	Total
< 5 km	50	8	58
Between 6-10 km	18	10	28
>10 km	4	10	14
Total	72	28	100

Source: own survey; 2024

The table revealed a clear relationship between distance and loan repayment among 100 borrowers. Those living closest (<5 km) had the highest repayment rate (50 repaid, 8 not repaid (86% success). Repayment declined with distance: 18 repaid vs. 10 not repaid (6-10 km group) and only 4 repaid vs. 10 not repaid (>10 km group). The data showed proximity strongly correlated with better repayment, suggesting distance created logistical challenges or reduced accountability. Notably, 72% of all defaults came from borrowers living beyond 5 km, highlighting distance as a significant risk factor for none repayment .Therefore, it has negative effect on input loan repayment.

4.1.2.12 Distance of market from their home and loan repayment

Table 4.19 Distance of market from their home

Distance in km from home	Frequency	Percentage
3km	26	26%
3-5km	32	32%
5-7km	42	42%
Total	100	100%

Source: own survey; 2024

Table 4.19 show that, from the total respondent, 26% of the respondent have distance 3km from microfinance, 32% of the respondent have distance between 3-5km from home to market, and 42% the respondent have distance greater than 10km from home to market, this indicated that more of the respondents have distance greater than 7km. They could be not sale their outputs on times and could not purchase inputs from the market. So it has negatively affected loan repayment.4.1.3 Market information of inputs and outputs of respondents and loan repayment

Table 4.20 market information of inputs and outputs of respondents

Information about I/P&O/P	Frequency	Percentage
Yes	80	80%
No	20	20%
Total	100	100%

Source: own survey 2024

As shown on the above table 4.20, from the total respondents, 80% more of the respondents have more information about inputs and output markets, and 20% of the respondents have no full information about inputs and output markets. This shows that more of the respondents have more information about inputs and output markets before use it and after produce their outputs. Therefore, it has positive impact on loan repayment.

4.1.3.1 Sources of information and loan repayment

Table 4.21 Sources of information of respondents

Sources of information	Frequency	Percentage
TV station	15	18.75%
Radio	20	25%
DA Agents	27	33.75%
Neighbor	18	22.5%
Total	80	100%

Source: own survey 2024

As a result of table 4.21, from the total respondents 33.75% more of the respondents gets full information about inputs and output markets from DA agents, 25% of the respondents have get full information from radio station, 22.5% of the respondents gets information about inputs and output markets from neighbor and 18.75% of the respondents gets full information from TV station about inputs and output markets. This shows that more of the respondents were gets more information from DA agents about inputs and output markets.

Therefore, getting more information from different sectors, the farmers could be more produced and more of there could be paid the loan repayment. Therefore, it affected positively loan repayment.

4.1.2.12 Amount of labor force for agricultural products and loan repayment

Table 4.22 Amount of labor force for agricultural products

Agricultural labor forces	Frequency	Percentage
One labor	18	18%
Three labor	22	22%
Five labor	40	40%
Seven labor	20	20%
Total	100	100%

Source: own survey 2024

Table 4.22shows that, from the total respondents, 18% of the respondents were participated on agricultural activity by one labor forces, 22% of the respondents were participated on agricultural activity by three labor forces, 40% more of the respondents were participated on agricultural activity by five labor forces and 20% of the respondents were participated on agricultural activity by seven labor forces. This indicated that, more of the respondents were participated on agricultural activity by five labor forces.it means as the respondent's farm sizes increase the loan repayments also increase. So it had positive relation with loan repayment.

4.1.3.2 Contact of DA agents of respondents and loan repayment

Table 4.23 Contact of DA agents of respondents

DA Agents contact	Frequency	Percentage
Yes	84	84%
No	16	16%
Total	100	100%

Source: own survey; 2024

As shown on the table 4.23, from the total respondents 84% more of the respondents were contacted DA agents during the production seasons, and 16% of the respondents were not contacted DA agents during the production seasons. This show, more of the respondents were contact DA agents during the production seasons and discuss with there.as they contacted more with Agents their products also increase, it leads to increase the loan repayment. Due to this reason it has positive relation with loan repayment.

4.1.3.3 Dates of DA contacts of respondents and loan repayment.

Table 4.24 Dates of DA contacts of respondents

Dates of DA contacts in year	Frequency	Percentage
12 dates	20	23.8%
16 dates	22	26.19%
20 dates	24	28.57%
24 dates	18	21.42%
Total	84	100%

Source: own survey; 2024

As the result of table 4.24, 23.8% of the respondents were contacted 12 dates with DA agents per year, 26.19% of the respondents were contacted 16 dates with DA agents per year, 28.57% some of the respondents were contacted 20 dates with DA agents per year and 21.42% of the respondents were contacted 24 dates DA agents per year. As the farmers contacted more days with DA agents, they get more experience about increase their products, then as the increase in their products the loan repayment also increases. So it has positive relation with loan repayments.

4.1.3.4 **Types of input loans taken by farmers and loan repayment**

Table 4.25 Types of input loans taken by farmers in the woreda.

Types of input loan	Frequency	Percentage
Improved seeds	54	54%
Fertilizers	33	33%
Chemicals	13	13%
Total	100	100%

Source: own survey 2024

As shown on the above table 4.25, from the total respondents 54% of the respondents were take improved seeds for agricultural products, 33% of the respondents were take fertilizers for agricultural products, and 13 % of the respondents were take Chemicals for agricultural products. This indicated that, more of the respondents were take improved seeds for agricultural products than others.as more of the respondents' use more inputs for agricultural product's it increase the agricultural outputs, then it leads to increases the ability of loan repayment. So it have positive relation with loan repayment.

4.2 Econometric analysis of the study

4.2.1 Regression analysis result

This part explained over all the empirical result of the regression and its effect on agricultural input loan repayment. The following regression model applied to know which variable was positive and negative relation with loan repayment, and statistically significant or insignificant with agricultural input loan repayment in the study area.

Table 4.26 logistic regression result

Logistic: SXHH, AGHH, EL, FS, DMFI, UI, TR, ND, DLO,T FRMS.

In the following table, coefficient, standard errors, z-values, and P-values, explanatory variable vif and corr for regression and number of observations included are presented

NO	Variables	Coefficients	Standard error	Z	p>/z/	Marginal effect
1	SXHH	-2.546827	.976127	-2.61	0.021	-.1859311
2	AGHH	-.0239723	.0260946	-0.92	0.358	-.0017599
3	EL	.5285367	.1905307	2.77	0.028	.0388008
4	FS	.2021844	.196714	1.03	0.337	.0148427
5	DMFI	.0366111	.1271329	0.29	0.770	.0026877
6	UI	.2107841	.7707985	0.27	0.780	.0150563
7	TR	3.730966	1.481595	2.52	0.017	.1861921
8	ND	-.2408529	.7172579	-0.34	0.732	-.0173502
9	DLOT	2.654106	.9425151	2.82	0.035	.1755877
10	FRMS	.5540707	.2050235	2.70	0.048	.0406753
11	Cons	-12.16242	3.764369	-3.23	0.001	

Number of observation = 100 * significant at 5%

Source; STATA13 result

The contribution of each individual variable to the explanation of agricultural input loan repayment with independent variable using the logit regression analysis on table 4.26 shows that, five variables, among the ten hypothesized explanatory that were included in the model, were found to be statistically significant at various probability levels, sex, education level of household, training of household, distribution loan on time, and farm size were found important determinants that affect loan repayment in the study area. The remaining five variables were not statistically significant at the conventional levels of significance.

In light with of the above summarized model results possible explanation for each significant independent variable are given as follows:-

Sex

The study found that, sex of households affect agricultural input loan repayment negatively and significantly at 5% probability level of significance. This means, loan repayment of female household is less than 0.185 birr on average than that of male probably when we hold other variables constant. The result may be due to females have low experience in different activities of production.

Education

Education was significant determinants that affect agricultural input loan repayment. He found that education that affect loan repayment positively and significantly at 5% probability level of significance. Holding other variable constant, as increase in one level of education will lead to increase loan repayment by 0.0388 birr on average probably. This may be as households educate more and more, their awareness on adaptation of new technology increase. Modern technologies have positive impact on productivity and which increase income of farmers. When income increases, repayment of loan also increases.

Training

The study found that, the training of the household to be also significant for determining agricultural input loan repayment at 5% probability level of significance. This means, training of the household as increase by one person, the loan repayment of household will lead to increase by 0.18619 birr on average probably when we hold other variables constant. The result may be increase of supply of labors.

Distribution loan on time

The study found that, the distribution loan on time to be also significant for determining agricultural input loan repayment at 5% probability level of significance and affect positively. This means, distribution loan on time as increase by one person, the loan repayment of household will lead to increase by 0.17558 birr on average probably when we hold other variables constant. The result may be increase of supply of labors.

Land size

As show the above result, the land size of respondent was affect loan repayment positively and significantly at 5% level of significance. This means, as increase 1 hectare of household's farm land will lead to increase loan repayment by 0.04067 birr on average.

4.3. Diagnostics Test

The overall significance of the variable was tested by Prob> Z. If Prob> Z less than0.5 (5%) then the explanatory variables included in the model are jointly statistically significant and the explained variable. As a result show Prob> chi2= 0.0000 then, this is the p-value associated with the chi-square statistic. A very low p-value (essentially 0 in this case) indicates the model statistically fits the data better than a model with just an intercept.

Pseudo R^2 = 0.5653: This is a pseudo R-squared statistic, similar to the R-squared in linear regression, which indicates the proportion of variance in the dependent variable (likely agricultural input loan repayment) explained by the model. A value of 0.5653 suggests the model explains a moderate proportion of the variance. (See appendix A).

4.3.1. Goodness-of-Fit Test

In this case, with a chi-square (Prob > chi2) is greater than 0.70 there is more good fit and chi-square is very high p-value of 0.9945, we can conclude that the logistic regression model for " agricultural input loan repayment" has a good fit to the data. There between the factors considered and "agricultural input loan repayment" based on the available data. (See appendix D).

4.3.2 Test of Multicollinearity

The Variance Inflation Factor (VIF) values indicate the extent of multicollinearity among independent variables. A VIF value greater than 5 is typically considered indicative of significant multicollinearity, while a value exceeding 10 is often regarded as problematic.

In the analysis of multicollinearity among the independent variables in our regression model, the Variance Inflation Factor (VIF) was calculated for each variable. The VIF quantifies how much the variance of a regression coefficient is inflated due to multicollinearity with other predictors. The results

indicate that the variable Education level(EL**)** has a VIF of **2.83**, suggesting moderate multicollinearity; however, this value does not exceed the critical threshold of 5.

In this anlaysis the other independent variables ranging from **1.08** to **1.50**, indicating low to moderate multicollinearity. The average VIF across all variables is **1.48**, which suggests that, on average, the independent variables are not highly correlated with one another. The analysis demonstrates that multicollinearity is not a significant concern in this study, as none of the variables show excessive correlation, thereby supporting the validity of the regression models. (See appendix C)

4.3.3. Hetroscedasticity test

When the problem of hetroscedasticity exist in the model, the variance the dependent variable (Y) and the variance of the residual term (Ui) of the model is not uniform (not constant). The major sources of hetroscedasticity are model misspecification bias, omission of the relevant variables from the model and the wrong mathematical form of the model. If this problem exists in the model our conclusion would be misleading. Therefore, the researcher was employed the breusch-pagan test to detect the problem.

In the context of our regression analysis, the Breusch-Pagan/Cook-Weisberg test was conducted to assess the presence of heteroskedasticity, which refers to the condition where the variance of the error terms is not constant across all observations. The test results yielded a chi-squared statistic of **7.84** with a corresponding p-value of **0.0051**. Given that the p-value is significantly lower than the conventional threshold of **0.05**, we reject the null hypothesis of constant variance. This indicates strong evidence of heteroskedasticity in the model, suggesting that the variability of the error terms is influenced by the levels of the independent variables.

Therefore, addressing this issue is crucial to ensure the robustness of our regression results. Thus, the Logit model which is used in this study is corrected for Hetroscedasticity problem using the robust command in Stata. (See appendix E)

CHAPTER FIVE

3. CONCLUSION AND RECOMMENDATION

In this chapter the major findings of the study are summarized; conclusion and recommendation

Conclusions are drawn based on the findings and recommendations are forwarded for the concerned bodies.

5.1 CONCOLUSION

Agricultural input loan repayment is the main economic activity in developing countries like Ethiopia. Even though input loan repayment is the necessity for their economy; it has not been able to pay at the requirements time for the organizations. Hence, they have less understand about agricultural input loan repayment. With this, the main objective of this study is to examine the determinants that affect agricultural input loan repayment in Cheha woreda. To examine this problem the cross-sectional data has been collected. The paper has employed both descriptive and econometrics statistics to analysis the stated objective.

Based on the descriptive and econometric analysis results the researcher reaches on the following major conclusions. In descriptive statistics the researcher found that the average of loan repayment between male household and female household is different in which the male households repay more than female households.

The average of loan repayment among who educated are different from those who do not educated. From this finding of p-value, the researcher found that the average of loan repayment that is educated is more than who did not have educated.

The household average of loan repayment that far from the microfinance is less than whom near to the microfinance institution. The researcher also found that distance from microfinance has negative impact on loan repayment.

In econometric analysis the researcher found that educational level of households, family size and farm size of loan repayment are affect in the study area positively and significantly whereas, sex of household, age of households and distance of household from microfinance were affect loan repayment in the study area negatively and significantly.

From the finding the researcher obtained that, the educated farmers and not educated farmers has variation in loan repayment amount in the study area. The farmers who are educated pay more than those who did not educate it .This imply that education has positive effect on loan repayment.

Distance from microfinance has also effect on loan repayment. The farmers, who near to the microfinance repaid greater than from those who repaid far from microfinance, From this the researchers conclude that distance from microfinance has negative effect on loan repayment.

Amount of farm land used cultivated in hectares of land was affected loan repayment in the study area positively and significantly. From this the researcher found that, household use farm (land) size to increase the agricultural input loan repayment in the study area.

Finally, Loan repayment of farmers are highly depend up on sex, age, educational level, family size, distance from micro finance, distribution of loan on time and farm size.

5.2 RECOMMENDATION

- As we saw earlier, agricultural input loan repayment is very low. Many determinants caused for this low loan repayment. To overcome this problem the following points out looked.
- Education was positively related and significant with farmers to repay loan on time. This clearly shows for effective utilization of loan taken, educated farmers is necessary before the loan is given. Therefore, the concerned body should try to give loan for more educated farmers as a possible to increase the payment of agricultural input loan.
- Training was positively related with farmers to repay loan on time. This clearly indicates for effective utilization of loan taken, enhancing or a warring and training farmers before the loan was given. So the concerned body should train farmers on the use of loan for agricultural production
- Family size is positively related repayment of loan on time. This indicates that the human labor force increase development of country in general. In addition to this, this indicates in each family size the availability of active labor force and capacity of this active labor force should improve through education to make them productive.

- Distance from micro finance of farmers negative related with loan repayment of farmers on time. Therefore, the concerned body should establish micro finance as much as possible nearest to the farmers.
- As much as possible, the administration body or any concerned organization should try to establish farmers' cooperatives and organization to improve price of agricultural output that is low at harvest period.
- Natural disaster is negatively related with loan repayment of farmers on time, so the concerned organization should try to expand the use of irrigation, supply chemicals on time and give advice as farmers collected their products on time.
- As much as possible, the administration body or any workers of the organization should be try to give more advices for farmers about religious and organization to improve the collection mechanism of payments at harvest period, or at available time.
- Finally, the findings of this study and the recommendations are consistent with the growth in increasing loan repayment through increasing the level of education used with loan and increasing its productivity by applying good loan practices.

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APPENDEX I

Appendix A

Logistic: SXHH AGHH EL FS DMFI UI TR ND DLOT FRMS

Logistic regression	Number of obs	=	100
	LR chi2(10)	=	71.70
	Prob > chi2	=	0.0000
Log likelihood = -27.569934	Pseudo R2	=	0.5653

ALR	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
SXHH	-2.546827	.976127	-2.61	0.009	-4.460001	-.6336534
AGHH	-.0239723	.0260946	-0.92	0.358	-.0751168	.0271722
EL	.5285367	.1905307	2.77	0.006	.1551033	.90197
FS	.2021844	.196714	1.03	0.304	-.1833679	.5877366
DMFI	.0366111	.1271329	0.29	0.773	-.2125647	.285787
UI	.2107841	.7707985	0.27	0.784	-1.299953	1.721521
TR	3.730966	1.481595	2.52	0.012	.8270937	6.634839
ND	-.2408529	.7172579	-0.34	0.737	-1.646653	1.164947
DLOT	2.654106	.9425151	2.82	0.005	.8068099	4.501401
FRMS	.5540707	.2050235	2.70	0.007	.1522321	.9559093
_cons	-12.16242	3.764369	-3.23	0.001	-19.54045	-4.784392

Source; STATA13result

Appendix B

Multicollinearity test (corr)

. corr (obs=100)

	id	ALR	SXHH	AGHH	EL	FS	DMFI	UI	TR	ND	DLOT	FRMS
id	1.0000											
ALR	0.1286	1.0000										
SXHH	-0.1676	-0.2229	1.0000									
AGHH	0.0553	-0.0816	-0.0945	1.0000								
EL	-0.0990	0.5630	-0.1270	-0.0162	1.0000							
FS	0.3574	-0.0366	-0.1537	0.3397	-0.2382	1.0000						
DMFI	0.1023	-0.4559	0.1187	-0.0207	-0.7626	0.1909	1.0000					
UI	-0.1090	0.0548	-0.0162	-0.1760	-0.0159	-0.0433	-0.0474	1.0000				
TR	0.1916	0.3789	0.0733	-0.0339	0.3414	0.0260	-0.2692	0.0865	1.0000			
ND	0.0212	0.1216	-0.0907	-0.1188	0.1383	0.0019	0.0200	0.1120	0.1287	1.0000		
DLOT	-0.0978	0.1989	0.0974	-0.3069	0.0220	-0.0949	0.0836	0.0905	0.0343	0.0925	1.0000	
FRMS	-0.2144	0.3526	-0.1464	-0.1178	0.1420	-0.0041	-0.1326	0.1269	0.1628		0.0554	0.0696	1.0000

Source; STATA13

Appendix C

multicorrelinarity test(VIF)

. vif

Variable	VIF	1/VIF
EL	2.83	0.353242
DMFI	2.59	0.386091
AGHH	1.30	0.767304
FS	1.28	0.781623
TR	1.22	0.819717
DLOT	1.14	0.875592
SXHH	1.13	0.888784
ND	1.11	0.900425
FRMS	1.09	0.915661
UI	1.08	0.926731
Mean VIF	1.48	

Source; STATA13result

Appendix D

Goodness of test

.estatgof

Logistic model for ALR, goodness-of-fit test

number of observations =	100
number of covariate patterns =	100
Pearson chi2(89) =	58.74
Prob>chi2=	0.9945

Source; STATA13

Appendix E

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance

Variables: fitted values of ALR

chi2(1) = 7.84

Prob>chi2 = 0.0051

Robust Test

Logistic regression

Number of obs = 100

Wald chi2(10) = 26.84

Prob > chi2 = 0.0028

Log pseudolikelihood = -27.569934

Pseudo R2 = 0.5653

ALR	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
SXHH	-2.546827	.8047709	-3.16	0.002	-4.124149	-.9695053
AGHH	-.0239723	.0242015	-0.99	0.322	-.0714064	.0234618
EL	.5285367	.1641563	3.22	0.001	.2067963	.8502771
FS	.2021844	.211913	0.95	0.340	-.2131574	.6175261
DMFI	.0366111	.1355846	0.27	0.787	-.2291298	.3023521
UI	.2107841	.7006253	0.30	0.764	-1.162416	1.583984
TR	3.730966	2.045082	1.82	0.068	-.277321	7.739253
ND	-.2408529	.679141	-0.35	0.723	-1.571945	1.090239
DLOT	2.654106	.882936	3.01	0.003	.9235828	4.384628
FRMS	.5540707	.197894	2.80	0.005	.1662055	.9419359
_cons	-12.16242	3.565544	-3.41	0.001	-19.15076	-5.174083

Source; STATA13result

APPENDIX II

WOLKITE UNIVERSITY

COLLEGE OF AGRICULTURE AND NATURAL RESOURCE

DEPARTMENT OF AGRICULTURAL ECONOMICS

A Survey Questionnaire;

Dear respondent, this questionnaire prepared by agricultural economics student in Wolkite University for conducting a research on determinants that affect agricultural input loan repayments of farmers in Cheha woreda for the fulfillment of bachelor arts (BA)degree.

Direction: - for close ended question put tick mark **(□)** in a given box and for open ended question give short & precise answer.

Address: **…….**; mobile +…….

I Demographic characters' of respondents

1. Sex, male ☐ female ☐

2 .Age, _____years old

3. Education level of respondent that completed highest grade Illiterate ☐ primary ☐ secondary ☐ certificate ☐ diploma ☐ degree ☐

4. House hold Family size _____, male_____ female _____

5. How many of your family stay in agricultural productivity? , male _____ female _____

6. Marital status, unmarried ☐ married ☐ divorced ☐ widowed ☐

II Socioeconomic and institutional characteristics of respondents

7 Would you have own agricultural land? Yes ☐ No ☐

8 How much amount of land you have cultivated in the last year? _____Hectare

9. From where would you have got the agriculture input loan? From Farm association ☐ NGO ☐ from government ☐ others, please specify_____

10. Have you got on time loan requests for the above purchase of agricultural input?

Yes No ☐ ☐

11. If not for question number 12, what is the reason?

Very high ☐ High ☐ moderate ☐ low ☐

12. What can you say about interest payment for the agricultural input loan?

Very high ☐ High ☐ moderate ☐ low ☐

13. What is your distance from the organization which give you credit service?

<5k ☐ 5-10 km ☐ >10 km ☐

14 How distance of the market from your own home? _____Km(s).

15. Would you have got loan repayment training in the last year? Yes ☐ No ☐

16. Is price of agricultural output is low at harvest period? Yes ☐ No ☐

17. If your answer is yes for question no 18, what is the reason?_____

18. Would you have faced natural disaster or natural hazards in the last year? Yes ☐ No ☐

19. Which one of it you would be faced from the below?

Drought ☐ acidic rainfall ☐ fungi ☐ death of animals sickness of ☐ parents ☐ others _____

20. Did you use irrigation? Yes ☐ No ☐

21. If your answer is yes for question No 22, did you repay loan from the income that you get from irrigation? Yes ☐ No ☐

22. Would your productivity of agriculture increased after use of irrigation? Yes ☐ No ☐

23. Did you have experience on the usage of loan before the last year? ☐ Yes No ☐

24. Did you repay loan you get on time? Yes ☐ No

25. How much amount of money you are paid? _____in birr

26. Did you have information about input market and output market? Yes ☐ No ☐

27. If your answer is yes: for No 28, where you got this information? From TV ☐ Radio ☐ DA agents ☐ from neighbor ☐ others _____

28. How many numbers of labor force did you use for agricultural production? _____Male ____ female _____

29. If your answer is yes, what is the reason?

High productivity of crop ☐ high output price ☐ low input price others _____

30. Would you have hired additional labor force for your own agriculture activities?

Yes ☐ No ☐

31. Did you contact DA agents to extension agricultural training? Yes ☐ No ☐

32. If your answer is yes for question No 33 how many days would you contact per seasons? _____days.

33. Did you know made fail to input loan repayment? Yes ☐ No ☐

34. Would you have got agricultural input loan in the last 12 months? Yes ☐ No ☐

35. If your answer is yes, for No 36, what types of loan you can got?

Improved seeds ☐ ☐ fertilizers ☐ chemicals

others_____

THANKYOU

FOR YOUR PARTICIPATION!!!!