



Determinants of Wheat Value Chain Finance: The Case of Hetosa and Lode Hetosa Districts of Arsi Zone, Oromia, Ethiopia

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ABSTRACT

This research endeavor aimed to explore the factors influencing the financing of the wheat value chain in Hetosa and Lode Hetosa districts of Arsi zone, Oromia, Ethiopia. The specific objectives were to identify the determinants of credit utilization among wheat producers and examine the limitations and opportunities within the wheat value chain finance in the study area. A combination of qualitative and quantitative data from primary and secondary sources was collected. Primary data was obtained through semi-structured questionnaires administered to 154 farmers, 4 wholesalers, 4 flour factories, 8 retailers, 6 input suppliers, 20 consumers, and 4 bakeries. Descriptive statistics were utilized to analyze the socio-characteristics of the respondents, as well as to identify the challenges and opportunities associated with wheat value chain finance in the research area. A logit model was employed to assess the factors influencing the financing of the wheat value chain in Hetosa and Lode Hetosa districts. The results of the Binary logit model revealed that variables such as gender, educational level, wealth status of households, farm size, credit source, loan size, and interest rate significantly influenced the credit utilization of households in wheat value chain finance. Consequently, it is recommended that governmental and non-governmental organizations engaged in crop value chains should prioritize awareness campaigns and provide sufficient loan sizes based on households' demands, while maintaining reasonable interest rates. Specifically, efforts should be made to promote education through extension services, enhance gender equity and equality in value chain finance, diversify and expand credit sources with fair interest rates, and develop alternative collateral options.

KEYWORDS: credit, interest rate, value chain finance.

INTRODUCTION

Background

As stated by Diriba (2020), agriculture serves as a vital driver of the Ethiopian economy, making a substantial contribution of approximately 27.5 billion dollars or 34.1% to the GDP. Furthermore, it is a significant employer, engaging about 79% of the population. Additionally, agriculture accounts for 79% of hard currency earnings and plays a pivotal role as a primary source of raw materials and capital for investment and market purposes.

Ethiopian's highland and mid highland in general, the South-eastern, Central and North Western parts are the areas where wheat is widely grown in. In summer, which is the main cropping season of the country, wheat's mean national productivity shown 26.75 quintals/hect while produced on 1,696,082 hectares of land with nearly 2% of annual

increment in production area. According to the World Bank (2018), the regions of Oromia, Amhara, and Southern Nations, Nationalities, and Peoples Region (SNNPR) are responsible for 59%, 27%, and 9% of the total wheat production in Ethiopia, respectively. Wheat not only comprises a significant portion of cereal production but also holds strategic importance in achieving national food independence in Ethiopia, as highlighted by Amare *et al.* (2015). However, the majority of farmers in Ethiopia are smallholders who primarily cultivate wheat for self-consumption, resulting in limited surplus available for commercialization (Amentae *et al.*, 2017; Endalewet *et al.*, 2020).

Despite its significant production potential, a mere 20% of the overall wheat production is traded, while the remaining 80% is allocated for household consumption, seed purposes, in-kind payments for labor, and as animal feed, as indicated by Kim *et al.* (2016).



The inadequate connection to the market and post-harvest losses pose as significant obstacles to the commercialization of wheat production, thus resulting in minimal economic gains for wheat farmers in the country due to a low rate of wheat commercialization. Hence, it is crucial to prioritize the development of the wheat value chain in order to unlock the unexplored potential for commercialization of this crop, thereby ensuring food security at both the national and household levels (Amentaeet *al.*, 2017; Endalewet *al.*, 2020).

Value chain finance encompasses financial products and services that are directed towards any stage of a value chain, facilitating investments that enhance the profitability, growth, and competitiveness of the chain's participants. While financial transactions within a value chain have existed previously (such as production finance, which can be viewed as a form of "value chain finance"), there are several key aspects that differentiate a value chain finance approach. These include the focus on improving financial access at specific points within the value chain to enhance the overall competitiveness of the entire chain, as well as involving multiple actors and leveraging relationships to reduce or mitigate risk. Adopting a value chain approach involves considering the risks and returns not only for the finance provider but also for the value chain participant seeking financial support.

The environment for wheat value chain finance is influenced by the growing focus on controlling the agricultural sector through gains from economies of the food chain along with access to resources, multinational and other interconnected agribusinesses characterized by increasing integration. Uncertain and dramatic changes in food prices have increased the vulnerability of agricultural production in meeting global demand and requires advanced agricultural investment at all. The enquiry is how the right amount of investment can be acquired, while the financial uncertainty in wheat value chain causes a reduction in available resources along with amplified scrutiny and fear of risk. The difficulty in financing agriculture through formal financial institutions and approaches, addressing wheat value chain goes beyond conventional measures (WB, 2012).

Livelihoods are dependent upon both what produces and how that production fits with competitive chains in the market system. Hence the emphasis is important if it is in the context of understanding the details of each chain even at a community level. From a livelihood and financial viewpoints, it is too important to understand the status of a chain from the advantage of each actors within a chain. The values of tightening integration are profound, especially for smallholders and others who are outside of the interlinked chains. Generally, agriculture is progressing towards a modern, competitive system determined by consumer demand for higher value, more processed products, and

consistent quality and safety standards. Hence, enhancing productivity, competitiveness, and value chain actors and finance are noted as priorities of the agricultural development (WB, 2016).

Objective

The overarching objective of this study was to examine determinants of wheat value chain finance in Hetosa and Lode hetosa districts of Arsi zone, Oromia region, Ethiopia.

The specific objectives of the study were:

1. To identify credit participation determinants among wheat value chain finance operators in the area of study.
2. To examine opportunities and constraints in wheat value chain financing in the study area.

Conceptual Framework of the Study of the Study Area

Demographic factors like age, sex and education level of the households affect the participation of household credit participation in different ways. Age of actors has differential impact on participation and obtaining the finance of wheat value chain. Study undertaken by Idowu (2011) found that the probability of actors' participation in wheat value chain activity increases with age. In most empirical evidences male is found more likely participate in wheat value chain practices and finance (Awoniyi and Salman, 2008). Evidences from the study carried out by Babatudne and Qaim (2009) show that more likely participation in finance of married actors than single, divorced or widowed.

In addition to demographic factors households credit participation is affected by some socio-economic factors. For example family size indicates family labour that could involve in wheat value chain events since human capital is vital for the participation in wheat value chain activities (Damite and Negatu 2003). Education is a human capital development, measured by years of schooling, and this indicates the return to education is most likely to be highest. (Ibekwe et al. 2010) discovered a favorable relationship between education and credit participation in Nigeria. Non-poor in this study is expected have positively influence on access to credit in wheat value chain. Smallholder farmers encountered challenges for accessing formal credit in Finance Institutions to invest in rice farming activities because of diversified reasons like lack of adequate collateral or guarantor, high interest rate which is difficult for SHFs to afford, lack of bank information and lack of good business plan (Kwizera A., 2016)

Finally, the effectiveness of wheat value chain requires the accessibility of wheat value chain finance. As a result, investigation was made on the determinants of wheat value chain finance in Hetosa and Lode Hetosa districts of Oromia regional state in Ethiopia.

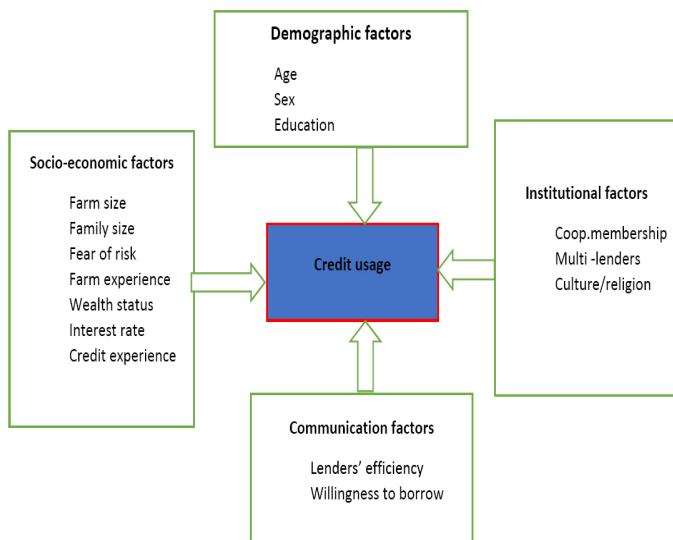


Figure 1. conceptual framework of credit participation in Wheat value chain finance

METHODOLOGY

Description of the study Area

This study was undertaken in south Eastern Part of Ethiopia in two potential districts (namely Hetosa and lode Hetosa districts of Oromia regional state) in wheat production. Description for each district is given below.

Hetosa is an administrative unit of the Arsi Zone, located around 123 kilometres southeast of Addis Abeba and 34 kilometres north of Asella, the Arsi Zone’s seat. The district is located between 7°53’29” -8° 14’ 40” N and 39° 5’ 1” to 39° 30’ 58” E. Hetosa district is sub divided into 23 kebeles and its traditional agro-ecological classification comprises highland (20%), midland (48%) and lowland (32%). Its annual mean temperature, rainfall and altitude vary between 14C°-27C°, 700-2000mm, 1500-4170 masl respectively. Its major soil types are clay soil (26%), loam soil(57%) and sand soil(17%). Its land covers and land use are farmland (69.49%), forest land (21.46%) and grazing land (2.75%).

Total number of kebeles in Hetosa district are 23 and 17,727 Smallholder farmers are living on subsistence rain feed mixed farming system: mainly livestock rearing and crop production. The major crops grown are maize, wheat, teff, vegetables, finger millet, fruits and etc. whereas those livestock are goat, cattle, horse, sheep, donkey, mule, etc. The two kebeles from Hetosadistrict where this study was conducted are Jengokilisa and Oda jila. They were chosen at random from the existing 23 kebeles using a simple random sampling approach, they have 930 and 396 number of SHF producing wheat respectively.

Lode Hetosa is around 140 km southeast of Addis Abeba and 51 kilometres northeast of Asella, the Zone’s capital. The district is located between 7°53’29” -8° 14’ 40” N and 39° 5’ 1” to 39° 30’ 58” E. Lode Hetosa district has 19 kebeles and the range of its traditional agro-ecological classification vary from highland (55%), midland (40%) and lowland (5%)

agro climatic zones. Its temperature, rainfall and altitude vary from 13C°-26C°, 800mm-1400mm, 1400-2900 masl respectively. Its major soil types are clay soil (35%), loam soil(50%) and sand soil(15%). Its land covers and land use are farmland (56.4%), forest land (7.4%) and grazing land (10.2%).

The number of kebeles in Lode Hetosa district are 19 and 22,350 Smallholder farmers are living on subsistence rain feed mixed farming system; mainly livestock rearing and crop production. The major crops grown are maize, wheat, teff, vegetables, finger millet, fruits and etc. whereas those livestock are goat, cattle, horse, sheep, donkey, mule. etc. The two kebeles from Lode Hetosa district where this study was conducted are Fursa and Melkajebi. They were chosen at random from the existing 19 kebeles using a simple random sampling approach, they have 347 and 850 number of SHF producing wheat respectively.

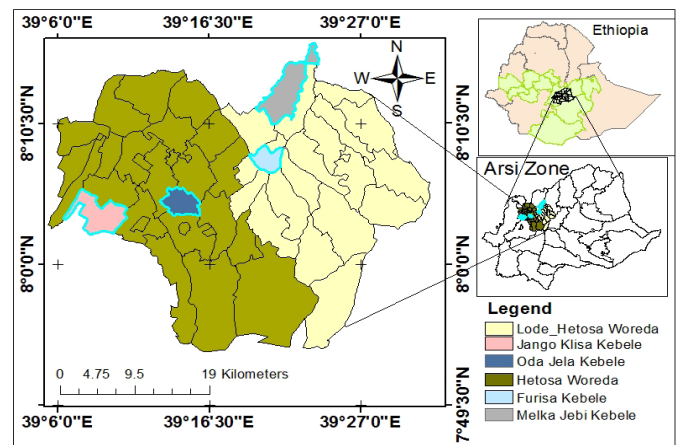


Figure 2. Map of the study area

Sampling Procedure and Sample Size

Sample Size Determination

Zar’s sampling formula was used to calculate sample size. Hence the homogenous nature of the farmers have made the researcher to estimate sample of them at 8% margin of error (Zar, 2010). Generally, the respondents’ selection for this study was the combination of selecting key informants, wheat producer householders at the study site and traders(processors, whole salers and retailers) processors distributors and consumers by using theZar’s formula indicated as follow.

$$n = KI + \frac{N}{1 + Ne^2}$$

Whereas; -

- n = over all sample size
- KI = no of key informants (other WVCF actors)
- N = no of householders
- e is level error at 92% confidence interval

$$n = 46 + 2523 / 1 + 2523 * 0.08^2 = 193 + 7 = 200$$

The minimal level of accuracy permissible is 10%. However, for this study 8% precision level was used. This approach is similar with the procedure followed by (Samson F.,2018) to determine sample size of households participating in koga irrigation project chosen for wheat value chain analysis

Sampling Procedure

Selection of Householders

In this study, a random sampling procedure which is probability sampling technique was used to select Districts,kebeles and respondents in order to collect primary data from representative samples. After selection of Districts and Kebeles was completed, list of all Small holder farmers (SHF) was collected from FTCs of each selected kebeles both in Hetosa and Lode Hetosa districts for selection of wheat producer farmers, then 21-57 wheat producing farmers from each of the four kebeles were selected based on their population size of farming household using systematic random sampling.

In Hetosa district 12 kebeles out of 23 and in Lode Hetosa 10 kebeles out of 19 have similar potential in wheat production. The kebeles were grouped into high wheat potential and les potentials.So, taking these high potential kebeles as total population 4 kebeles (Jengokilisa and Oda jila from Hetosa district and Melkajebi and Fursa kebeles from Lode Hetosa) were chosen at random using a basic random sampling approach to eliminate bias that may occur during sample selection.

The target population for this study were wheat producing smallholder farmers in Hetosa and Lode Hetosa districts, input suppliers, agro-processors (flour factories and bakeries), consumers and traders (retailers & whole salers) in the area

of study. Incorporating all target population as respondents for this study is not economical and timely wastage. Consequently, selecting sample representative respondents was crucially conducted for data collection. In this study, a systematic random sampling procedure which is probability sampling technique was used to select respondents in order to collect primary data from representative samples.

Selection of another Respondents

In addition to farmers 4 wholesalers,4 flour factories,8 retailers and 6 input suppliers, 4 bakeries and 20 consumers were selected using systematic random sampling in the two districts. Therefore, a total of 154 small holder farmers and 46 other wheat value chain finance actors were selected as respondents for this research in the study area. In addition to the above respondents experts in government organization and financial institution who were working on relevant position and thus have knowhow on wheat value chain finance practices were purposely selected and participated on responding to the questioners provided to them regarding the determinants of wheat value chain finance in the study area. Accordingly, following the stratification of respondents into key informants and householders, the selection of Key informants was done before householders because they are crucial source of basic information and facilitator for this study. In all, 28 key informants were purposively chosen to participate as respondents. Specifically, there are 8 DAs,8 experts from the two districts (4 from Agriculture and 4 from Cooperative Promotion Agency),4 zonal experts from Agriculture office and Cooperative promotion Agency,3 OCSSCo officers (1 from Iteya,1 from Huruta and 1 from zone) and 4 loan customer officers from CBE and Oromia Coop. Bank Huruta&Iteya branches, and 1 input supply and credit expert from Hetosa Union.

Table 1. Distributions of sample households in sampled kebeles

Districts	Kebeles	Number of households	Proportion	Sample house holds
Hetosa	Oda jila	396	6%	24
Hetosa	Jengokilisa	930	6%	57
Lode hetosa	Fursa	347	6%	21
Lode hetosa	MedaBisheni	850	6%	52
Total		2523	6%	154

Source: Hetosa and Lode hetosa Agriculture office

Types, Sources and Methods of Data Collection

In order to meet the study’s goal, both qualitative and quantitative data were gathered from primary and secondary sources. Primary data was collected from input suppliers, wheat producers, Traders (wholesalers and collectors), processors (flour factories and bakeries), consumers, financial institutions, experts and extension agent in public offices.

Data for this study were collected from sampled respondents, by using multiple instruments of data collection to overcome the limitation of each instrument of data collection.

Interviews, structured and semi-structured questionnaires, and focus group discussions were used to gather both forms of primary data from respondents. The questions were asked in order to collect primary data. Following the pre-test, the questionnaire was delivered to the responders.

Secondary data was collected from relevant sources through the review of different published and unpublished documents, books, magazines, recorded data and reports in different organization (Zone, District, kebeles public institutions and NGOs).



KII was conducted first because it helps to select the sample interviewees. It was done to develop the interview guides for the survey and to strengthen the sampling units obtained. Using Snow-Ball Method a total of Twenty-eight experienced and who were believed to have had a good deal of information on Value chain finance such as DAs, zone and District experts, officers from financial institutions.

Based on information obtained from the KII and the sampling units obtained from Kebele development agents, and household surveys was carried out. For the interviews, questionnaires were written in English and translated into Afaan Oromo. The draught questionnaire was pre-tested on eight randomly selected households (two from each kebele). Both closed and open-ended questionnaires were designed to collect primary data on determinants of wheat value chain finance, the continuous and dummy variables determining household credit usage, socio-economic characteristics and demographic of respondent.

In this study, FGD was undertaken to support the data which were collected from household survey and KII (for purpose of triangulation) and to obtain additional information. It was conducted with a total of 28 households with relevant group from women household heads, youth, experts, team leaders of agronomy, kebele leaders and DAs from all the sampled kebeles. In each of the kebeles, a single FGD group composed of 7 participants with different age, sex and level of education were selected purposively from sampled kebeles.

Methods of data Analysis

The data gathered from wheat producers, traders (wholesalers & retailers), processors (flour factories & bakeries) and consumers was analyzed using two types of data analyses: descriptive statistics and econometric analysis.

Descriptive and Inferential Statistics

Descriptive statistics were employed in the study to present the characteristics of sample units: to compare and contrast different categories of sample units (individuals) with respect to the desired characteristics. Frequencies, proportions, ratios, averages, and other descriptive data were used to identify constraints and opportunities in the WVCF in the area of study. Inferential statistics, such as the t-test and chi-square, were employed to investigate correlations between variables (dependent and independent).

Econometric Analysis

Binary logit model was used to analyse the determinants of wheat Value Chain Finance as those are credit users and non-credit users. Econometric analysis can provide critical information about causal relationships between independent and dependent variables. A dependent and an independent variable comprise an econometric model. The error terms, or to be more precise stochastic disturbance terms, stand for unobservable random variables that may not explicitly included in the model. The error term may also reflect

randomness in measurement errors, and has certain assumed properties such as a mean, variance, and covariance. The generated coefficients represent the influence of a change in the independent variables on the dependent variable (Wooldridge, 2002).

For an econometric model analysis with binary explanatory variables, analysis was done through representing these variables as dummy variables credit users and non-users. The binary logit model posits that individuals are given a choice between two options based on their attributes. As outlined in (Gujarati, 1995) and (Greene, 2018), logit model is widely applied and easy to analysis for a limited dependent variable which has a binary outcome. Furthermore, it is employed because it is mathematically simpler than the probit model. Hence binary logit model was used to investigate the determinants of credit usage of small holder wheat producers.

Logit Model Specification: - In this study, the observations were coded "1" for credit users and "0" for non-users and were used as a dependent variable. The general empirical logit model is specified as

$$(5) \quad Z_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_n X_{in}$$

Where Z_i is binary dependent variable, X_n 's = explanatory variables that determines the households' credit participation, β_0 is the constant term, β_n 's are coefficients to be estimated

RESULT AND DISCUSSION

Description of Factors Affecting Credit Usage of Households

The household survey (table 2) indicated that the majority of the sampled respondents 133 (66.5%) were male while female respondents were 67 (33.5%). From the total 113 credit users 103 (91%) were male participants while 10 (9%) were females. There were 87 credit non-user responders in all. Out of this 30 (34.5%) were male and 57 (65.5%) were female households. The number of credit users in female-headed families is lower than in male-headed households. The implication is that male-headed families utilise credit more than female-headed households. This may be due to female traditionally lack of skill and information on financial activities. This finding is in line with the finding of (Nwaru J. et al 2011) that stated as females at household and wider community and national context are affected by financial, economic, cultural, political, and legal obstacles.

Survey result (table 2) indicated that credit usage was highly affected by wealth status of the households. 72.4% of the non-credit user households have reported that the wealth status of the household has high effect on credit usage. Key informant and FGD participants were witnessed that people with good asset (wealth) have better chance to get credit. This might be related to the idea that wealthy households have a better ability to diversify their income creation and

readily repay debt than impoverished households, and they have assets to give as collateral. This study is in line with that of (Adamon N.M., et al 2017) that says wealthier households have more demand and participation on credit. This may be explained by the fact that rich households are viewed by prospective lenders as more capable of repaying their loans without default because of their high-income generation potential.

The result of this study indicated that 73% of the respondents reported that credit usage for wheat value chain was highly affected by interest rate (Table 2). This means that large interest rate hinders the respondent in credit usage to undertake wheat value chain activities. This result is consistent with the findings of (Nugusie Efa, 2017), who found that interest rates had a detrimental impact on credit demand.

The survey result (table 2) revealed that 72% of the credit source for wheat value chain in the study area was Micro Finance Institution (MFIs). The Key informant and FGD participants were witnessed that Micro finance institutions are working in all rural and urban kebeles of Hetosa and Lode Hetosa districts, so they are highly accessible to all households everywhere in the study area. This result is in line with (Efa G., et al 2017) that investigated credit demand and participation of teff and wheat smallholder farmers decreases when they are not accessible to formal credit source.

The result of this study (table 2) indicated that 55.5% of the respondents reported that credit participation for wheat value chain was highly affected by loan size. The KI and FGD participants were agreed with the idea of households and underlined that the loan size delivered by most accessible finance institution like MFIs is too small that most households are not encouraged to use their credit. This means that small loan size hinders active participation of the respondent in credit usage. This result is consistent with the findings of (Nugusie E. and Catherine N., 2017) loan size is one of the determinant factors that affects households' preference and participation on credit, hence based on their past experience households prefer large loan size providing organizations to properly accomplish their business activities.

According to the current study (table 2), the average age of household heads who used and did not utilise credit was 44.96 and 47.47 years, respectively. The statistical outcome (t-test, $p < 0.05$) revealed a significant difference between the two groups. This means that the average age of credit non-users household heads was greater than that of users. This illustrates a negative relationship between household age and credit utilisation; that is, as household head age grows, so does the number of credit user households. This finding was consistent with (Lemane G., et al., 2019), who found that increasing the age of a family by one year reduces the likelihood of farmers participating in loans by 0.69%. It might be because elderly farmers have a higher financial base

and are less likely to seek financing. Contrary to the findings of this study and the long-held belief that as agribusiness firms age, they become more conservative and reluctant to seek credit, studies conducted in Uganda (Mpuga, 2010) and Nigeria (Akpan et al, 2013) found that household age is positively related to loan demand.

The Survey result (table 2) showed that the average of household head **education** for credit users was 9.03 class i.e. greater than that of credit non-users and significant at 1% level. This result showed that as education level increases, the credit user households' increases. This may be true because educated household heads know about credit importance better than uneducated household heads. The result was consistent with that of (Girma and Abebaw, 2015) that reported an increase in education level enhances demand and participation of smallholder farmers in credit.

The finding of this research (table 2) revealed that households with small **family size** uses credit than large family sized households. The average size of households that were credit users and those that were non-users were 4 and 5, respectively (t-test, $p < 0.05$). This shows that households with many members were more likely to generate more source of income than those with fewer members. Furthermore, large household size can be associated with the difficulty of regulating the behaviour of their family members and fear of risk. The finding of the current study was against (Doreen A., et al., 2014) that stated There exist a positive and significant relationship between demand for credit and family size. Here the argument could be if the households have larger family numbers, they may not need to hire additional labour for their agribusiness activities, hence less or no demand for credit.

The results of the study also indicated that households with higher experience in farming activities are better users of credit than those with lower farm experience. Table 5 shows that the difference between the two groups was statistically significant (t-test, $p < 0.05$). This shows that households with higher farming experience were able to use credit for the value addition of wheat production than lower farming experience households at this particular study area. This might be due to knowledge and skill gap in wheat production experience for diverse accomplishments. The present study's findings were comparable to (Elly K. 2019) farmers' demand and participation to credit increases as their farm experience increases in climate smart agriculture villages of Kenya.

The finding of this study (table 2) showed that households with higher **farm size** are better usage of credit than those with lower farm size. There was a statistically significant difference between the two groups (t-test, $p < 0.05$). This demonstrates that in this research location, households with bigger farm sizes were able to use credit more than those with lower farm sizes. This result is in line with (Nugusie Efa and Catherine N., 2017) that states HHs with larger land holding have higher demand and participation to credit.

Table 2. Description of variables by credit usage status of wheat value chain finance actors

	Variables	Mean/proportion			
		all samples (200)	Nonusers (87)	Users (113)	X ² /t-Value
1.	Sex (Male)	133	30 (34.5%)	103(91.2%)	70.86
2.	Marital status (Married)	156	64(73.6%)	92(81.4%)	2.28
3.	credit source (MFI)	144	70(80.5%)	74(65.5%)	89.9
4.	loan size (high)	111	60(68.9%)	51(45%)	59.27
5.	lenders efficiency (high)	13	5(5.7%)	8(7%)	5.53
6.	wealth status (high)	116	63(72.4%)	53(46.9%)	24.80
7.	household awareness (yes)	155	51(58.6%)	104(92%)	3.86
8.	interest rate (high)	146	75(86%)	71(63%)	19.77
9	fear of risk (low)	50	14(16.1%)	36(31.9%)	8.67
10	experience on credit utilization (yes)	175	74(85%)	101(89.4%)	0.84
11	Age of HH	200	47.47	44.96	-2.45
12	HH education level	200	4.30	9.03	13.30
13	Family size	200	5.06	4.43	2.29
14	Farm Experience	200	16.95	19.11	2.80
15	Land(farm) size	200	3.91	4.24	1.34

Source: Author’s survey (2022)

Determinants of Wheat Value Chain Finance (WVCF) in the Study Area

The results in Table 3 indicate that, the pseudo R² of the model is 0.8357 indicating a good fit of the model. It demonstrates that the fluctuation of the explanatory variable in the model explains about 83.6% of the variance in the dependent variable. Loomis and Walsh (1997) suggested that R² values exceeding 50% are considered acceptable in empirical estimation.

The chi-square statistics revealed that the model is highly significant with at 1% confidence levels. The x² test shows the goodness-of-fit, the recommended test for fitness of logit regression model considered stronger than the traditional chi-square test (Garson,G.D 2016). The result of the x² (log likelihood ratio of chi-square) value was 228.87 at 15 variables and the percentage of right prediction is 83.57. These analyses showed that the results were satisfactory.

Sex of household: The sex of household was found to have positive correlation with credit participation at 5%significance level (Table 3). This study reveals that, if all other characteristics are held equal, being a man increases the likelihood of partaking in credit by 38%. This suggests that male families have a greater likelihood of participating in credit than female households. This result is in line with a research done at Northern Ghana by Balana(2016) reported that as a result of local traditions, culture, and norms, women have less access to collateral, such as land and livestock, which gives them lower chances of getting loans; the loan terms and conditions were too rigid to suit women’s needs; and women have relatively limited knowledge about credit

and are more often illiterate and unable to complete the paperwork needed for formal credit.

Educational status of household head: Household head education in the model result was found to have positively correlated with credit usage for wheat value chain financing and significant at 1% level (Table 3). The result showed that if remaining other factors remain constant as education level increases by one class, the probability of households’ credit usage increases by 17.78%. This may be true because educated household heads understand about the benefit of credit for the production of wheat better than uneducated household heads. The result was consistent with the studies conducted in different countries for example in Nigeria (Oni *et al*, 2005; Akpanet *al*, 2013), in Kenya (Messah, 2011), in Uganda (Mpuga, 2010), in Pakistan (Khan and Hussain, 2011), in China (Rui and Xi, 2010; Tang *et al*, 2010), in Ethiopia (Girma and Abebaw, 2015) and in Ghana (Akudugu, 2012).were reported the presence of a positive association between educational level and credit usage.

Credit source: The source of credit was found to have positive correlation with household credit usage for wheat value chain financing at 5% significance level. This result shows that if remaining other factors constant as accessibility of credit sources with conducive lending procedures increases by 1%, the probability of household credit usage for wheat value chain finance increases by 31.40 %. This means that the agribusiness firms’ credit usage increases with easy accessibility and with less complicated lending procedures of financial institutions. The findings were consistent with the findings of (Efa G., et al 2017), who explored loan demand and involvement of teff and wheat smallholder farmers when they do not have access to official credit sources.

Loan size: It was associated with credit participation and was statistically significant at the 95% confidence level (Table 3). The result shows that, keeping all other things the same, if the loan size given to the borrowers increased by 1%, credit participation of the households increases by 26.60%(Table 3). This means that if the loan size provided by finance institutions is higher, households' opportunity to use credit increases due to higher ability of undertaking different activities that help for wheat value chain. The finding was similar with that of (Nugusie E. and Catherine N.,2017) loan size is one of the determinant factors that affects households' preference and participation on credit, hence based on their past experience households prefer large loan size providing organizations to properly accomplish their business activities.

Wealth status of household: It was associated with credit participation and was statistically significant at the 95% confidence level (Table 3). The result shows that, keeping all other things the same, for those having higher wealth have higher probability of credit usage by 20.92% as compared with who do have lower wealth. This means that households who have higher wealth an opportunity to participate in credit due to ability higher collateral. The primary element in credit participation is wealth status.The finding was similar with that of (AdamonN.M.,et al 2017) the wealthier households have more demand and participation on credit. This may be explained by the fact that large rich households are viewed by prospective lenders as more capable of repaying their loans without default because of their high income generation potential.

Large interest rate: The large interest rate was found to have negative correlation with credit participation at 5% significance level. This study reveals that if all other

parameters stay constant, when interest rates rise by 1%, the likelihood of households participating in credit falls by 29.94%. This means that relatively large interest rate reduce chance of credit usage than lower interest rate. It might be due to fear during payment of the credit with high interest. The results were consistent with Nugusie Efa.2017 that confirmed interest rate negatively affects credit demand. Another studies conducted in the Philippine (Briones, 2009), Ghana (Akudugu, 2012), Ethiopia (Komicha, 2007) and Thailand (Wiboonpongseet *al*, 2006) discovered that increasing the effective lending rate has a negative impact on loan demand. In general, high transaction costs were found to negatively influence the participation of actors in wheat Value chain finance.

The survey results (table 3) also indicated that household's **farm size** positively correlated with credit usage, and it was statistically significant at 5% significance level. The implication of this result is that household land size is among important variables that determine household's tendency in credit participation. This showed that relatively households who have higher land size have better interest to use credit than those who have lower land size. If all other parameters stay constant, increasing household land size by one hectare raises the likelihood of household credit consumption by 24.92%. The finding of the current study agrees with research results in different countries like (NugusieEfa and Catherine N.,2017) in Ethiopia,(Khan and Hussain, 2011) in Pakistan, (Komicha, 2007) in Ethiopia, (Bing *et al*, 2008; Tang *et al*, 2010) in India and (Barslund and Trap, 2008) in Vietnam revealed that farm size has significant and positive relationships with credit participation. This might imply that households with larger farms: (1) are in a better position to provide assets required for collateral, (2) need additional capital to finance their farm activities or expansion.

Table 3. Binary Logit regression estimates of determinants of HH credit usage

Variable	Coef.	Std. Err.	Z	P> z	Marginal effect
Sex of HH	1.20	0.51	2.37	0.02**	0.38
Age of HH	-0.00	0.09	-0.03	0.97	-0.00
Marital status	0.06061	0.45	0.13	0.89	0.02
Family size	-0.37378	0.35	-1.08	0.28	-0.10
Education level of HH	0.63225	0.18	3.52	0.00*	0.18
Farm experience	0.02001	0.10	0.21	0.83	0.00
Credit source	1.11	0.45	2.47	0.01**	0.31
Loan size	0.95	0.41	2.27	0.02**	0.27
Lenders efficiency	-0.19	0.42	-0.46	0.64	-0.05
Wealth status of borrower	0.74	0.22	3.25	0.00*	0.21
Borrower awareness	0.70	0.63	1.11	0.26	0.20
Large interest rate	-1.06	0.42	-2.51	0.01**	-0.30
Fear of risk	0.79	0.42817	1.84	0.06	0.22

Lack of experience	1.24	1.37367	0.91	0.36	0.44
Farm size	0.89	0.36021	2.46	0.01**	0.24
_cons	-12.60	4.84425	-2.60	0.00	

Note: * and ** show significant difference at 1% and 5% significant level respectively

Number of observation = 200 Log likelihood = -22.50 Pseudo R² = 0.84

LR chi2 (19) = 228.87 Percentage of right prediction = 83.57

Prob>chi2 = 0.00 Percentage of prediction failure =16.43

Constraints and Opportunities of Wheat Value Chain Finance in Hetosa and Lode Hetosa Districts

Constraints

Wheat production constraints in the study area

According to the survey results (table 4), the greatest obstacles in the sample kebeles of this research were insect and crop disease, particularly wheat rust, which respondents identified as a big problem year after year. There is no irrigation facility so that the respondents complained that they can't produce more than once a year. High interest rate of credit service, long and bureaucratic process of credit application that takes huge time of the borrowers hindered most households from going to credit service providers, the loan size given by MFIs is very small, so that the borrowers can't buy the amount of input they want for their wheat value chain activities.

Credit from banks is difficult to get for most WVCF actors because of the required fixed assets for collateral. The Hetosa and Lode hetosa districts were noted for their mechanised farming, but producers indicated that the bulk of the mechanisation services in the region were for land preparation and harvesting; they did not have mechanisation technology for planting and cultivating. The producers have appreciated the effort made by government for the last two years to provide credit for the purchase of agricultural inputs, but they pointed on the following problems with this credit scheme. The board of agro-input credit is a District Finance office, but this office has no staff from kebeles and has no direct relationship with the farmers like that of agriculture office. Because of this farmers' registration, screening for credit and giving training on credit and agro-input utilization issues were faced difficulty. Credit committees were not well organized at kebele level so that they don't screen the farmers on time. Because of this the credit delivery time is mostly at or after planting time. Delay or absence of the input types needed by the farmers to take/buy on credit is also another constraint reported by the respondents.

This result is similar with finding of (Kwizera A.,2016) that showed the major constraints faced by farmers to access formal credit to invest in rice farming activities in Rwanda were lack of adequate collateral or guarantor, high interest rate, lack of bank information and lack of good business plan.

Table 4. Major constraints faced by producers.

Activities listed as constraint	Respondents replied YES	
	Frequency(n=154)	%
Pest and disease of wheat	138	89.6
Lack of irrigation access	141	91.5
Lack of adequate improved seed of wheat	101	65.6
Limited credit access	84	54.5
Lack of adequate extension service	34	22
Lack of mechanization technologies for planting and cultivation	112	72.7
Large interest rate	132	85.7
Small loan size given by MFIs	114	74
Lack of fixed assets for collateral	98	63.6
Long and bureaucratic process of loan application	88	57
Own survey result 2022		

Wheat marketing constraints in the study area

According to survey result (table 5) Traders of wheat product reported that, wheat marketing is constrained by different factors. The major marketing constraints are limited access to market specially during the pick production season, low price

of product during high supply, price fluctuation, too much competition between traders, lack of storage, lack of modern packaging services, lack of working capital, lack of transportation service, poor road condition (inadequate infrastructure facility), market value of wheat is subject to very limited negotiation, lack of market information, given that almost all farmers sell to intermediaries rather to final consumers, absence of standardized packing and weighing scales, low quality product that cannot meet consumers demand, absence of contractual agreements for marketing, lack of policy framework in price setting strategy, lack of market integration among traders. This result is similar with the finding of (Samsom F,2018) in his research on wheat value chain analysis in koga irrigation project.

Table 5. Marketing constraints

Activities listed as constraint	Respondents replied YES	
	Frequency(n=12) wholesaler + retailers	%
Price fluctuation	5	42
Lack of adequate working capital	10	83.3
Lack of market information	8	66.7
Lack of modern storage	9	75
Illegal trade (trade with outlicense)	4	33.3
High broker influence on price setting	6	50
lack of policy framework in price setting strategy	7	58
Absence of contractual agreements for marketing	4	33.3
lack of market integration among traders	2	16.7

Source: Own survey 2022

Wheat processing constraints in the study area

Survey result(table 6) revealed that different wheat processing factors(flour factories) and bakery houses' efficiency was affected by different factors. Almost all processors reported that they face different challenges mainly power problems, water supply, lack of credit access, lack of working capital to expand their investment, lack of skilled man power who operates the machinery, price fluctuation of wheat throughout the year, lack of wheat supply and lack of quality wheat product. This result is in line with(Samson F,2018) efficiency of wheat processing factories was affected by list of factors like power problem, price fluctuation, lack of water supply and problem related with finance.

Table 6. wheat processing constraints

Activities reported as constraint	Respondents replied YES	
	Frequency(n=8) flour factories + bakeries	%
Price fluctuation	5	62.5
Power problem	8	100
Lack of adequate wheat supply	8	100
Lack of water supply	8	100
Lack of skilled manpower	4	50
Lack of quality wheat product	6	75
Lack of adequate credit service	7	87.5

Source:Own survey 2022

Opportunities

Wheat production opportunities in the study area

The survey result(table 7) and FGD indicated that the respondents have reported there are different production opportunities regarding the wheat value chain finance in the study area. These were: conducive agro ecology for wheat production, farmers in the area have long time experience on wheat production, the current input credit service being delivered by government was one of the golden opportunities that helps farmers those who can't buy agricultural inputs for their farm activities. Even though their requirement and credit delivery modalities were different there were significant number of credit service delivering institutions in the study area. There are NGOs like ATA and GIZ that were supporting the VCF actors by giving training on market linkage and value addition and then links the agribusiness firms to finance institutions. Overall

government attention to increase production and productivity of agriculture and expansion of agro industries were discussed as opportunities to promote WVCF.

This result is in line with (FAO and AFRACA, 2020) that showed Agricultural Value Chain Finance (AVCF) offers the producers to obtain finance that may otherwise not be available owing to lack of collateral or high transaction costs. It also offers the agribusinesses suppliers, buyers and processors in a way to build stronger buying and selling relationships and market growth.

Table 7. wheat production Opportunities of WVCF

Activities reported as opportunity	Respondents replied YES	
	Frequency(n=154)	%
Conducive Agro-ecology	136	88
Farmers' long experience on wheat production	122	79
Increasing number of agro-industries	82	53
Existence of many lending organization	68	44
Government's input credit programme	89	58
Existence of NGOs supporting on market linkage	63	41
Support from Union on credit delivery and training	52	34

Source: Own survey result 2022.

Wheat marketing opportunities in the study area

Survey result (table 8) indicated that availability of market demand (consumer demand) throughout the year, good experience in wheat trading, the increasing number of wheat processing factories, improvements in infrastructures such as road and mobile telephone network, and periodically increasing value of the product through processing as a result of increasing urban consumers demand for processed product as population growth in town. This result is similar with the finding of (Samson F., 2018) that reported wheat marketing was influenced by the rising demand of wheat and improved infrastructure in his study area.

Table 8. wheat marketing opportunities

Activities reported as opportunity	Respondents replied YES	
	Frequency(n=12)	%
Establishment of Rural Transformation Centre (RTC) around Iteya town that collects wheat and send to Bulbula Agro industry	7	58
High demand for wheat product	12	100
Improvements on road infrastructures	9	75
Increasing number of wheat processing agro industries	11	92

Source: Own survey result 2022.

wheat processing opportunities in study area

Survey result (table 9) indicated that increasing demand by consumers for wheat products (flour and bakery), the current attempt to improve the quality of wheat by grouping farmers in Farmers Production Cluster (FPC) and giving them training, the increasing number of wheat traders were reported as opportunities for wheat processors.

Table 9. wheat processing opportunities.

Activities reported as opportunity	Respondents replied YES	
	Frequency(n=8)	%
RTC establishment	7	87.5
Rising demand for processed wheat product	8	100
Increasing attempt to improve wheat quality	7	87.5
Increasing number of traders for processed product	8	100

Source: Own survey result 2022.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Participation of producers, processors and traders in the value chain finance is determined by sex, education level, wealth status, credit source, loan size, farm/land holding size of the households and interest rate of the credit. The major constraints of wheat value chain finance are long and bureaucratic process of credit application that takes huge time of the households, small amount of loan given by MFIs, credit from banks is difficult to get for most WVCF actors specially for farmers because of the required fixed assets for collateral, power interruption limited water supply to factories. Despite these constraints there are opportunities for wheat value chain finance in Hetosa and Lode Hetosa districts. They are Conducive agro ecology for wheat production, long time farming experience of farmers in the area, current input credit service being delivered by government for those who can't buy agricultural inputs for their farm activities, increasing demand for wheat and wheat products presence of NGOs supporting the VCF actors by giving training on market linkage and value addition and then linking the agribusiness firms to finance institutions.

Recommendations

The following points were suggested based on the study's findings:

Increase the awareness of households by continuous training and capacitating of farmers through extension services for improvement of production, and productivity and for better market linkage. This enables flow of information and transfer of knowledge and scientific findings that will help farmers in production of value-added products. Hence their demand and credit usage also increase.

To make females equally being befitted with male households from the credit services, to change their livelihood and keep gender equity the government and NGOs working on Agriculture production and commercialization have to give due attention to female empowerment and awareness creation.

Input suppliers specially the financial input providers have to focus on availing adequate loan size with reasonable interest rate based on the demand of households' instead of putting credit ceiling just like MFIs today. This will help to resolve the problems of agribusiness firms' credit usage constraints related to large interest rate and small loan size.

All the concerned government and NGOs have to cooperate to solve the production, marketing and processing constraints of wheat value chain finance by providing technical support and credit package like revolving funds which can help to support households with smaller farm size.

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