Determinants of Farm Households' Participation on Off-Farm Employment: The Case of Jimma Arjo District, Ethiopia

A Thesis Submitted to the school of Graduate Studies of Jimma University, College of Business and Economics, in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Science in Economics (Economic Policy Analysis)

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Determinants of farm households' participation on off farm employment
(A case study of Jimma Arjo district of East Wollega zone, Oromia)

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DECLARATION

I hereby declare that this thesis entitled "Determinants of Farm Households' Participation on Off farm Employment: A case study of Jimma Arjo district of East Wollega, Ethiopia", has been carried out by me under the guidance and supervision of Dr. Leta Sera and Mr. Gadisa Abera (Msc). All sources of materials used for this thesis work have been duly acknowledged. I surely declare that this thesis work is original and has not been submitted for the award of any degree or diploma to any university or institutions.

Researcher's Name	Date	Signature
_____	_____	_____

CERTIFICATE

This is to certify that the thesis entitles "Determinants of Farm Households' Participation on Off farm Employment incase of Jimma Arjo District of East Wollega, Ethiopia", submitted to Jimma University for the award of the Degree of Master of Economic Policy Analysis and is a record of bonafide research work carried out by Mr. Gemechu Siyume Kejela, under our guidance and supervision.

Therefore, we hereby declare that no part of this thesis has been submitted to any otheruniversity or institutions for the award of any degree or diploma.

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Co-Advisor's Name	Date	Signature
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Abstract

This study examined the determinants of off-farm employment participation of farm households in Jimma Arjo district of Oromia region, Western Ethiopia. A total of 288 sample household heads were selected through multistage sampling procedure. So, the study was used primary data collected via questionnaire and interviews. The collected data was analyzed and presented quantitatively by using descriptive statistics (like mean, sum, percentage, frequency, Chi-square test and t-test). In addition, logistic regression model was also used to estimate the effects of hypothesized independent variables on the dependent variable. The survey result indicated that 69.45% of the respondents were participated on off farm employment and it also reveals the major off farm activities practiced in study area, such as; local trade, animal fattening and sale of local food and drinks. The result also identified the role of off farm activities to the farm households like: additional employment, learning new skills, increase purchasing power/ relaxation of financial constraint, food security, better health, educating children and better housing. The outcome of the logistic regression indicated that household heads' sex, education level, family size, family labour, access to credit, practice of saving and total livestock were significantly and positively influenced off farm participation; while household heads' age, land size, fertility of land(rich), access to training and distance from market were affected their participation negatively and significantly. The findings of the study suggest that, efforts should focus on the promotion of off farm opportunities through provision of physical infrastructure such as road, improving credit provision and improving educational status of farm households.

Key words: *off farm, participation, farm household, binary logit, Jimma Arjo*

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ACRONYMS

CC……...Contingency Coefficient

ILO……. International Labour Organization

LR …….....Likelihood Ratio

LPM ……..... Linear Probability Model

NGOs……. Non-Governmental Organizations

TLU……. Total Livestock Unit

VIF……. Variance Inflation Factor

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Agriculture is a proven path to prosperity. No region of the world has developed a diverse, modern economy without first establishing a successful foundation in agriculture. This is going to be critically true for Africa where, today, close to 70% of the population is involved in agriculture as smallholder farmers working on parcels of land that are, on average, less than 2 hectares. However, this farm land is not sufficient to meet family's basic needs, which forced most of smallholder farmers to engage in off-farm activity(Africa Agriculture Status Report, 2017). In addition, farm households are also participate in off farm activity due to agricultural related risks (Elias Giannakis, Sophia Efstratoglou and Artemis Antoniad, 2018).

Off-farm employment includes all non-farm employment plus labour sales to other farms by members of the household (Emerole, 2012). It consists of wage employment and self employment activities that earn income in return to the households' labor supplied outside their own farm. Wage employment includes paid development work, farm wage, skilled and unskilled regular wage (salary) employment and casual daily works. Self-employment comprises selling firewood and charcoal, stone mining, grain and livestock trading, petty trading, weaving, mat making, pottery and handcraft etc.(Alam, A., M. Murthi And R. Yemtsov, 2005).

The potential of the agricultural sector to contribute for living standard and poverty reduction effort requires increasing its productivity, which is found to be very difficult in most developing countries (David, 2010). Thus, widening a means of living is viewed as a response to the failure of agriculture to provide a sufficient livelihood for a substantial proportion of rural dwellers (Maharjan 2014). Off farm employment is one way of such widening means of living for most of Ethiopian rural households. However, it is not choice for majority of rural households, rather they are pushed into this employment due to a lack of on-farm opportunities, for example, as a

result of drought, Landlessness as well as adequacy and quality matter of land (Davis 2003, Derejew T, 2016).

Off-farm activity is considered to be an important component of the rural economy of developing countries (Amsalu Bedemo, Kindie Getnet, Belay Kassa and S.P.R. Chaurasia 2013). It holds out the prospect of improved livelihoods for people living in rural areas (Davis, J. R. and Bezemer, D, 2004). Therefore, Participation in rural off farm activity is one of the livelihood strategies among poor rural households in many developing countries. However, very little is known about the characteristics, constraints and opportunities of off farm employment, which make it difficult to assess how this job employment might contribute to poverty reduction despite this employment, provide a way for out of poverty (Lanjouw, P. and Murgai, R. , 2008).

The occurrence of different shocks like animal and crop diseases increases the probability of an Ethiopian farm households' participation into off-farm activities (Woinshet, 2010). Busy in agricultural works, lack of cash availability, fear of risk and lack of knowledge, absence of off-farm activity and no interest are the key reasons reported by non-participant respondents for not participating in off-farm activities (Derajew and Sundara, 2016).

Farm households in Ethiopia are participating in off farm activities to support their farms. Despite the importance of off farm income to the farmers less attention was given to the sector (Abebe Damte, 2002). Rural off-farm activity also plays significant role in employment creation, income generation and enhancing farm production activities(Mulat et al., 2006; Beyene, 2008).Thus promotion of off farm activity is indispensable to alleviate rural poverty. It reduces income inequality, easily accessible to the poor and improves the welfare of the poor and hence alleviates poverty. However, in Ethiopia, policy makers were mainly favoring agriculture as an exclusive means of rural economic development for a long time. There is also little empirical study on the off-farm participation of farm households in Ethiopia. This might be because of the role of the rural off-farm sector is the least understood component of the rural economy. Thus, researcher conducted this study on off farm activities scenario and its determinants in Jimma Arjo district of East Wollega zone.

1.2 Statement of the problem

Farm household in developing countries are endowed more with labour than with capital and land. Off-farm economic activities employ a significant proportion of the rural labour force, especially in land-constrained areas. Surplus human capital - as a result of scarcity of land - is commonly found in sub-Saharan Africa, North Africa, South Asia and Middle East where a wide gap exists between the actual numbers of people joining the rural labour force every year and the number of new jobs created in agricultural sector (World Bank, 2008). As a result, farm households in rural areas participate in off farm activity and thus diversify income sources to minimize agriculture related problems. So, off farm activity is a potential source of employment to the surplus rural labour, and may serve to encourage landless rural households to stay in rural areas and seek work in off farm rather than migrating to urban areas(Adam, 2001, Bernardin, 2012). Especially, this activity is very important to the poorest farm household (Haile Tewele, 2012).

Although rural households had willing to engage on off-farm activity to meet their needs and offset income shortfalls, participation appears to be constrained by capital assets: human, social, financial, and physical (Tefera, 2005, Honduras, Ruben and van den Berg 2001). Education of both the household head and other adults, availability of agricultural and non-agricultural machinery, access to electricity and water, having greater family labour as well as households headed by male are positively and significantly affects off farm employment participation. Distance to the market and family size on the other hand significantly hinders participation in off farm activity (Babatunde and Matin , 2010).

Farmers were motivated to enter the off-farm labor market to earn high incomes from the off-farm sector. However, they failed to participate in off-farm activities due to different barriers like personal and institutional constraints (Fikiru Tesfaye, 2008). Household wealth, private and public asset endowments and regional characteristics can play a critical role as they may enhance or hinder the probability of the household discussion on off farm participation (Escobal, 2001). Individual, such as education, skill and experience, gender and age, and household characteristics like family size and number of dependents, land size and other household assets, as well as,

communal assets like electricity, access roads are factors influencing off farm participation (Schwarze, 2004)

Several studies indicate the different constraints which affect the choice of rural households to diverse off farm livelihood strategies.The choice of off farm strategies were determined by demographic, socioeconomic and institutional factors (Derajew and Sundara, 2016). Lack of credit, lack of employment opportunities, lack of working capital, agricultural threat, lack of knowledge and skill, lack of information were also constraints of off-farm livelihood strategies choice (Ambachew and Ermiyas, 2016). An availability and variability of rain fall can also affect the participation of households in off-farm activities in rural Ethiopia(Bezabih, 2010).

Engdayehu Zewdie and Sivakumar. S, (2018) had identified off farm training, credit service, household saving, education of household, presence of draft animals and size of farm land as the major determinants of off farm participation in their study. Similarly,Bhatata Bp. and Arethun, T, 2013)found variables like; education, skill and experience, land size and other household assets, as well as, communal assets like electricity and access roads as a determinant for farm households to participate on off farm employment.

Depending on the evidence of reviewed literature, despite a number of studies are conducted on off farm employment, there has been no comprehensive and systematic investigation on determinants of rural households' participation on off farm employment in study area by considering the difference in the response of the farm household to the different personal, family, locational, social and farm characteristics as to the best of the researcher's knowledge. Also, the results of existed studies on other part of country cannot indicate (represent) the characteristics of the topic in study area due to off farm employment can be influenced by location and seasonal variables. Therefore, this research was undertaken to contribute an understanding on the determinants of farm households' off farm participation and describes the types and characteristics of off-farm activities existing in the study area.

1.3. Research questions

With a view to bridge the research gap, this study tries to answer the following main research questions.

- What are the existing off farm activities pursued by rural households of JimmaArjo district?
- What are the existing off farm activities contributions in the study area?
- What determines an individual's choice of participation in off farm employment?

1.4 Objective of the Study

1.4.1 General Objective of the Study

- The general objective of the study is to identify and assess the determinants of farm households' participation on off-farm activity in Jimma Arjo district, East Wollega Zone.

1.4.2 Specific Objectives of the Study

The specific objectives are:

- To identify off farm activity pursued by rural households in the Jimma Arjo district.
- To examine the contribution of off-farm activities existing in the study area.
- To identify and analyses factors affecting farm households' participation in off farm employment in study area.

1.5 Significance of the Study

The study will contribute to the frame of knowledge on household labour allocation decision for off-farm activity. It will contribute to the understanding of the push and pulls factors of farm households to participate on off-farm activity. Results of this study will be important in providing information for government and concerned bodies who are working on off-farm activity. This study will use as literature in the future by other researchers who can conduct research on similar topic. Moreover, it hopes to contribute better understanding of the forces that drive change in rural off-farm economy, opportunities and constraints. Additionally, better

understanding of the above will serve policy makers and planners to design appropriate rural development policies and strategies to improve the welfare of the farm household in Ethiopia.

1.6 Scope and Limitation of the Study

The study was undertaken in the confined area of Jimma Arjo Woreda, in Oromia regional state. Among all other options of rural households' livelihood strategies, the scope of this study was mainly limited to off-farm employment in the Woreda. Since farmers do not keep records and due to mind lapse researcher faced difficulty to get exact values for some questions.

Most farmers can only recall the most recent information and it was not possible to get previous data easily. Another problem faced during the data gathering was unavailability of the household heads in their home during the survey daytime. Thus, the way of reaching the farmers includes visiting them at meeting and working place. Thus, limitation of the study lies in collecting data. Moreover, transport facility and other necessary research inputs were major constraints in this research.

1.7 Organization of the study

The study has the following structural build-up. The first chapter consists of the introduction part. That is, it contains background of the study, statement of the problem, objectives of the study, significance of the study, scope of the study, limitation of the study, and organizations of the study. Chapter two is about literature review, chapter three is about the methodology, chapter four is about result analysis and discussion, and chapter five is about summary, conclusions and recommendations. At the end of the paper; references, appendix and questionnaire was attached.

CHAPTER TWO

LITERATURE REVIEW

2.1 The Conceptual Definition

Rural: Before embarking on a study of off-farm rural activities, it is also necessary to identify what is meant by both rural‟ and "off-farm".(Gordon, A. and Craig, C. , 2001) define that: the term "**rural**" is subject to a large amount of debate, hanging on three particular aspects: whether rural towns are rural or urban, at what size does rural settlement become urban, and the treatment of migration and commuting between rural areas and towns. There is no firm rule that resolves these issues.

Off-farm employment: Off-farm activities, defined as the participation of individuals in remunerative work away from a "home plot" of land. The economy of off-farm employment plays an increasingly important role in sustainable development and poverty reduction, especially in rural areas. Therefore, it has become an interest to governments, non-governmental organizations, international agencies and development practitioners; as such employment has become increasingly common in many developing countries. It has been considered as an alternative income source for the agricultural sector and as an essential way to increase overall rural economic activity and employment in many developing countries(Gordon, A. and Craig, C. , 2001).

Household income: consists of all receipts in cash, in kind or in services that are received by the household or by individual members of the household at annual or more frequent intervals, but excludes windfall gains and other such irregular and typically one-time receipts (ILO, 2013.)

2.2 Theoretical review

Non-farm activities can be defined as all those other than agriculture, livestock, forestry and fishing. Non farm is not quite the same as 'off-farm', another category often mentioned; the off-farm activities of a household include not only non-farm work but also may include wages from agriculture carried out on the farms of others. Strictly speaking, remittances derived from migration should be part of non-farm income, so long as they come from migrants still

considered – as is often the case – part of the rural household. In practice, however, it is usually clearer to treat remittances as a separate category of income than to add them to earnings derived from local business and employment (Rachel Sabates-Wheeler and Joseph Yaro, March 2018)

Off-farm activities, defined as the participation of individuals in remunerative work away from a home plot of land, have been seen to play an increasingly important role in sustainable development and poverty reduction, especially in rural areas. It has been considered as an alternative income source for the agricultural sector and as an essential way to increase overall rural economic activity and employment in many developing countries. From different literature, off farm activities in rural areas have surfaced much earlier than the theoretical and policy recognition of the non farm economy(Ellis, 2000)

The surplus labor assumption of the dual economy model in the 1970s showed large size of non farm labor use in developing countries initiating interest in small scale and rural non farm business activities (Haggblade, S, Hazell, B and Reardan T., 2007). The studies on micro and small-scale industries on income diversification give some insight in to the rural off farm economy in developing countries.

Non farm activities account for 30% of full-time rural employment in Asia and Latin America, 20% in west Asia and North Africa and 10% in Africa (Haggblade, 2007). These percent are from national censuses and typically include only primary occupation. The real extent of non farm participation is likely to be higher than what the national statistics suggest since many farmers engage in non farm activities as part-time employment or during agricultural slack seasons. A study that uses data from 15 countries found non farm participation rate, including both primary and secondary employment, in range of 67-94%. When these are considered in respective continents, the participation rates are 83% for Asia, 82% for Latin America and 78% for Africa. The size of non-farm employment is reflected in the level of income rural households earn from it (Winters, 2009).

2.1.2 Reasons for Income Diversification

Reasons for income diversification include declining farm incomes and the desire to insure

against agricultural production and market risks ((Van den Berg, M. and Kumbi, G.E., 2006)). That is, when farming becomes less profitable and riskier as a result of population growth and crop and market failures, households are pushed into off-farm activities leading to "distress-push" participation. In other ways, households are rather pulled into the off-farm sector, especially when returns to off-farm employment are higher or less risky than in agriculture, resulting in "demand-pull" participation.

Many studies assume that distress-push effects dominate: shrinking per capital land availability is often considered the main reason for increasing off-farm activities (Van den Berg, M. and Kumbi, G.E., 2006). This is especially true in countries of Sub-Saharan Africa. One reason is probably the dearth of solid and up-to-date information about the driving forces of household income diversification in specific contexts. So, relatively policy efforts have to promote the off-farm sector in a pro-poor way and overcome potential constraints (Lanjouw, 2008).

Decisions by rural households concerning involvement in non-farm activities depend on two major factors: incentives offered and household capacity. Some poor rural households make a positive choice to take advantage of opportunities in the rural non-farm economy, taking into consideration the wage differential between the two sectors and the riskiness of each type of employment. Rising incomes and opportunities off farm, however, reduce the supply of on-farm labor. Other households are pushed into the non-farm sector due to a lack of on-farm opportunities, for example, as a result of drought or small size of land holdings(Davis 2003).

Off-farm activity is one of rural activities, in which the poor can participate; because it does not require any complementary physical capital. (Wobst and Mduma 2005). Hagos (2003) studied at the effect of program credit on participation in off-farm employment. He found that the effect of program credit was positive and statistically significant on the level of income derived from self-employment, but that it had no significant effect in the case of wage employment. He also identified that this underscored the heavy impact of lack of access to capital on self-employment.

2.2 Empirical Literature Review

This is deals with several empirical studies on determinants of farm households' participation in off farm employment. There are several studies which are evident for determinants of rural households' off farm choice in different countries which is vary from one area to other even it is different between households and between individuals within households according to the contexts, local settings and asset holding of households. Household size plays a significant role in influencing farm household participation on off-farm activities. A large family size increases the participation in off-farm activitiesO' Brien and Hennessy, (2006), that show that large family size increases the necessity to participate in off-farm economic activities to generate additional income to meet consumption needs.

Education forms the basis for acquisition of skills and knowledge necessary to pursue livelihood strategies that broaden employment opportunities for individuals and may enable households to be more aware of off-farm employment opportunities in their surroundings (Davis and Bezemer, 2004; Sharad, 2006).Education improves access to income employment opportunities and determines the category of off farm employment individuals engage in. This is evidenced by a number of country-level studies, for exampleJanvry and Sadoulet, (2001) in a study of income strategies among rural household in Mexico showed that level of education has positive and significant effects on the tendency to participate in non-farm economic activities and influences participation in more lucrative activities.

Locations in which off-farm economic activities undertaken play an important role in driving people to participate in. Kueper, M. Neijerink, G. & Eaton, D. (2006) in their analysis of the role of non-farm employment in rural livelihoods covering seven countries in Africa and two in Asia, found a positive correlation between involvement in non-farm activities and household location. Households located in remote rural areas were less likely to be employed in the non-farm sector than those close to urban areas.

Household resource endowments (land, livestock, tools and equipment) play significant roles in determining the participation of rural households in non-farm activities. Sharad, 2006 pointed out that the extent of participation in non-farm economic activities between landholding and

landless households differ. Landholding households are typically engage in non-farm activities as secondary employment, while rural landless households see non-farm activities is primary sources of income; also limited access to land makes non-farm activities important sources of livelihoods and income for landless households and so play a significant role in reducing poverty for these households((BARRET, C. B., REARDON, T. & WEBB, P., 2001)

Missing credit markets can hinder diversification into outside farm activities or assets characterized by substantial barriers to entry as cited in Reardon et al, (2007). On the other hand, if off-farm options can be accessed easily, but credit markets are incomplete, non-farm earnings can be a crucial means for overcoming working capital constraints to purchasing necessary variable inputs for farming (e.g. fertilizer, seeds, equipment, labor) or to make capital improvements to one's farm (Woldenhanna, T. & Oskam, A, 2001)

Atamanov, (2011)tried to identify the determinants of individual participation in pure non-farm and a mixture of farm and non-farm activities based on a multi-nomial logit regression analysis. Results show that push factors like availability of small land size and poor land quality make individuals choose off-farm activities over agricultural activities. The negative influence of age of the household head and number cattle are also an indication of push factors. But he found also some indication of pull factors, for example, the marginal increase in land owned by the household (denoted by land owned square), decreases probability of participation in non-farm activities at a decreasing rate, indicating that there may be less incentive for those with ample access for land to divert from non-farm activities.

Olugbenga,O. Adewunmi,O., John ,O.Y. and Adebayo,M , (2011) have reported a result that supports the distress diversification hypothesis, for they found a negative relationship between non-farm-income and the farm output per hectare of land using a survey data from south West Nigeria. The study tries also to show the effect of other variables like education, age of the household head, farm size, household size and farm investment. Education of the head has positive and significant effect on the level of non-farm income at 5% significant level. The variables like farm size, household size and farm investment have a negative and significant correlation with non-farm income. The coefficient for age of the household head was not

significant and negatively correlated with non-farm income. (Oluwatayo., 2009)has made similar study on poverty and income diversification among households in rural Nigeria. Tobit regression model has used to show the determinants of livelihood diversification. Male headed, small sized family, non-poor households with formal education and better income and access to credit facility were affect the livelihood index positively.

Freese, (2010) has documented finding from Burkina Faso. This empirical paper uses Heckman two-step selection model to determine the probability of participation and level of income generated in the off-farm sector. The result shows having male headed households and more adult male members' decreases the probability of participation in off- farm sector for the poorest quin-tiles. Education, Household size and proximity to community structure variables influence participation positively for the pooled data and wealthiest households as well. Distance to local public infrastructure negatively significantly affects participation.

Lanjouw, P. and Murgai . R, (2008)were analyzed the role of agricultural wages and non-farm employment using a panel data in India. According to this literature; expansion of the non-farm sector is associated with falling poverty in two ways: a direct impact on poverty that is, likely due to a pro poor marginal incidence of non farm employment expansion; and an indirect impact attributable to the positive effect of non- farm employment growth on agricultural wages.

Onubuogu G.C and Oleru, (2017) conducted research on determinants of Engagement in Off-Farm Income Generating Activities in Nigeria; argues that the larger their household size the more they embraced these off-farm activities to be able to supplement income from farming. Gender was significant at 1% for non-farm employment, at 5% for petty trading and 1% for wage employment. This indicated that male headed homes were more likely to embrace these off-farm jobs in addition to their farming. Education was significant at 1% for non-farm employment, at 5% for petty trading, at 10% for wage employment and at 1% for manufacturing and construction. This showed that as heads of households were educated the more, they went into diversified job. Access to credit was significant at 1% for non farm employment, at 5% for petty trading and 1% for wage employment. Access to credit can make one go into diversify artisanal work, petty trading and engage in another job that will give him more money. Co-

efficient of farm size was not statistically significant in any of the job options rather it was negatively related to artisanal job and positively related to others. This means that as the size of farm holding of the respondents increased, they reduced engagements in artisanal jobs and increased it in other.

Sanusi W.A, Dipeolu A.O and Momoh. S, (2016)analyzed effects of farm and off-farm income on income-inequality; the result shows the coefficient of sex of the household heads was positive and significant at 1 percent indicating that belonging to a male headed household is positively associated with deriving income from non-farm wage employment, coefficient of household education level also reveals that as the years of formal education of the household head increases the share of income coming from non-farm wage employment will likely increase. This is normal as the more educated the head of a household, the more likely the household will generate income from non-farm wage employment like government and private salary employment. Farming experience was also negative and significant at 10 percent meaning that income from non-farm wage employment tends to reduce with increase is farming experience. The coefficient of access to credit and land ownership were significant at 1 percent but positive and negative respectively, this imply that household head with access to credit will earn more income from non-farm wage employment than those without access to credit, while those households without land will likely earn more income from wage employment than those who own land.

Babatunde and Matin, (2010) tried to analyze the determinants of participation in off-farm labor employment and incomes from it. Multivariate probit model was applied to estimate the determinants of participation in different off-farm employment activities. Education of both the household head and other adults, availability agricultural and non-agricultural machinery, access to electricity and water and households headed by male positively and significantly affects off farm employment participation. Distance to market and family size on the other hand significantly hinders participation. Household assets, access to electricity and pipe water encourage self-employment, where as market distance affects negatively. Farm size does not show any significant effect across all off-farm activities.

2.2.1 Empirical Literature from Ethiopia

Central statistical Agency (CSA) of Ethiopia, in collaboration with the World Bank, conducted a survey of non farm and off farm enterprises that covered four major regions of Ethiopia. The survey covered 14,646 households. This survey provided information on enterprises start-up, constraints and other operational characteristics. Around 75% of rural households engaged in non farm enterprise sector in Ethiopia, either permanently or seasonally/ as part-time employment. There was non-negligible difference in the participation rate across regional state of the country with the lowest in Amhara and the highest in southern region. Most enterprises were in trade sector (52%) and most common trade activities were retail sale via stall (shop) and markets (26%). Of female headed households, 41% of them were engaged in non-farm enterprises whereas only 15% of male headed households (Tefera, 2005).

Tefera, (2005) analyzed households' participation decision on non-farm of by using logit model. The study found that non-farm participation to be negatively correlated with agricultural income and Self-sufficiency and positively correlated with adult male labor. In Ethiopia, as compared to other factors of production there is relatively more labour power. When there is more family labour power, members motivated to participate in off farm activity due to scarcity of land for all family labourers. The probability of having greater number of adults in a household increases the decision of an individual to allocate labour into off farm activities. This is because the limited supply of land and other factors of production reduce participation into farming activities. In line with this, the occurrence of different shocks like animal and crop diseases increases the probability of farm households' participation into non-farm and off-farm activities (Woinishet,2010).

The study undertaken by Woldehanna, (2001) on household labor supply decision to non-farm employment, found upward sloping labor supply curve for both wage and self-employment non-farm activities. Moreover, the research found that labor is negatively correlated with agricultural land, livestock and non-labor income. It also estimated a multinomial logit model to analyze the choice between the two types of non-farm employment, and found that non-farm wage employment increases with family size and decreases with agricultural production and the

number of dependents. On the other hand, self-employment increases with agricultural production and is not affected by demographic factors. The result also imply that households engage in self-employment to gain attractive returns while they engage in wage employment because of push factors. Van den Berg, M. and Kumbi, G.E, (2006) also found that households heads who are married and literate are more likely to engage in non farm employment.

Mathewos and Nigatu, (2016)conducted the study on reasons for rural household's income diversification in case of Kadida Gamelaworeda, Southern Ethiopia.The result indicated that the most common reason for diversification (61%) was to meet household's necessity. The result also shows off farm wage employment decreases and off-farm self employment increases with an increase of farm output. Other variables that affect income diversification are number of dependents, family size, wage, area of land cultivated, livestock wealth and the value of off-farm equipment owned. Family size, wage and livestock wealth were positively correlated and number of dependents, land cultivated and non-labor income were negatively related with income diversification.

Berg and Kumbi, (2006)done research on non-farm participation and poverty reduction in Oromia region, Ethiopia. They used a multivariate probit model to estimate the relation between poverty and participation in non-farm sector. Non-farm activities were dis-aggregated in to three: hand crafts, food and drink and trade. They found, own cultivated land, which represents for rural household's productive asset has a negative and significant effect on participation across the three non-farm activities. This implies the relatively poor households are more likely to be engaged in non-farm sector. Households owning more pack animals are likely to participate in non-farm activities. Positive and significant effect of family size and negative effect of dependency ratio on the likelihood of taking part in food/drink activities shows that nonfarm activities are used surplus labor from agriculture. Age, experience and primary education positively affects participation in hand craft. While informal education affects positively participation in food/drink and trade. The effect of distance to all weather roads is positive for handcrafts and negative for food/drink.

Ashebir Demie and Negussie Zeray,(2015) conducted study in Eastern Ethopia and they found that the likelihood of earning income from non-farm economic activities was significantly influenced by capacity variables such as wealth and human capital. Having better education, land holding, access to irrigation and number of adult members positively influenced the likelihood of involvement in non-farm activities. The result also shows female-headed households were found more likely to participate in own business than male-headed ones. Estimation of the tobit model revealed that having access to credit, better land size, livestock and number of adults in the household significantly and positively influenced the share of income from off farm activities. It was also found that age and sex (male) of household head had positive effect on the share of income from rural non-farm activity.

Haile Tewele, (2012) used both bi variate probit and uni variate probit models to estimate the off-farm wage and off-farm self employment participation. The result figured out that age and formal education of the household head, number of children with 10 years old or under and district where the households live significantly affects participation in off-farm wage work. In contrary participation in off-farm self employment is determined by sex of the household head, number of adult males in the household, per capita non-labor income, credit use, per capita livestock holding, district and distance to the nearest all weather road and distance to the nearest major market. Similarly,Theodros, (2012) conducted study on characteristics of non-farm activity in case of North east Ethiopia, Tehuledere District. The result shows that coefficient of the location variable, low land agro-ecology is negative and has a significant effect on participation in trading activities. Households that live closer to market sites are more likely to be engaged in trade activities. Educated farmers are more likely to involve in non-farm activities.

Beyene, (2008) has used bi variate probit model to analysis the determinants of off-farm work participation decisions of farm households in Ethiopia. The result shows that human capital variables such as health and training on non-farm activities have a positive effect on the off-farm participation decisions of male members of farm households. The education status of the household head has no significant impact on the participation decisions of the members of the family as most of the off-farm activities do not require formal education. The availability of

credit and transfer income is the other factors that have a positive impact on the decisions of male members to participate in off-farm activities. The effect of farm characteristics (farm size) also shows that farmers are participating in off-farm activities for push reasons. The large farm size forces them to look for other sources of income. Therefore, poor and landless households may be benefited from the sector. The off-farm participation behavior of farmers is found to differ in different places in the country. It is higher in areas affected by drought and lower in relatively self-sufficient areas.

Research on rural households' towards off-farm and non-farm employment opportunities in Assosa zone, Western Ethiopia by Seid Sani, 2016) examined determinants of rural households' participation in off farm and non-farm employment opportunities using a data collected from 180 rural household heads. The binary logit model results figured out that settlement of household head, literacy status of household heads, household size, total income and membership in cooperatives have a positive and significant effect on rural household's participation in off farm and non-farm employment activities while age of household head, access to training, frequency of extension contact and distance to market found to have negative and significant effect on rural households participation on those activities.Tewelde, (2012)also found that age and formal education of the household head, number of children with 10 years old or under and location where the households live significantly affects participation in off-farm wage work. On the contrary, participation in off-farm self employment is strongly determined by sex of the household head, number of adult males in the household, per capita non-labor income, credit use, per capita livestock holding, district and distance to the nearest all weather road and distance to the nearest major market.

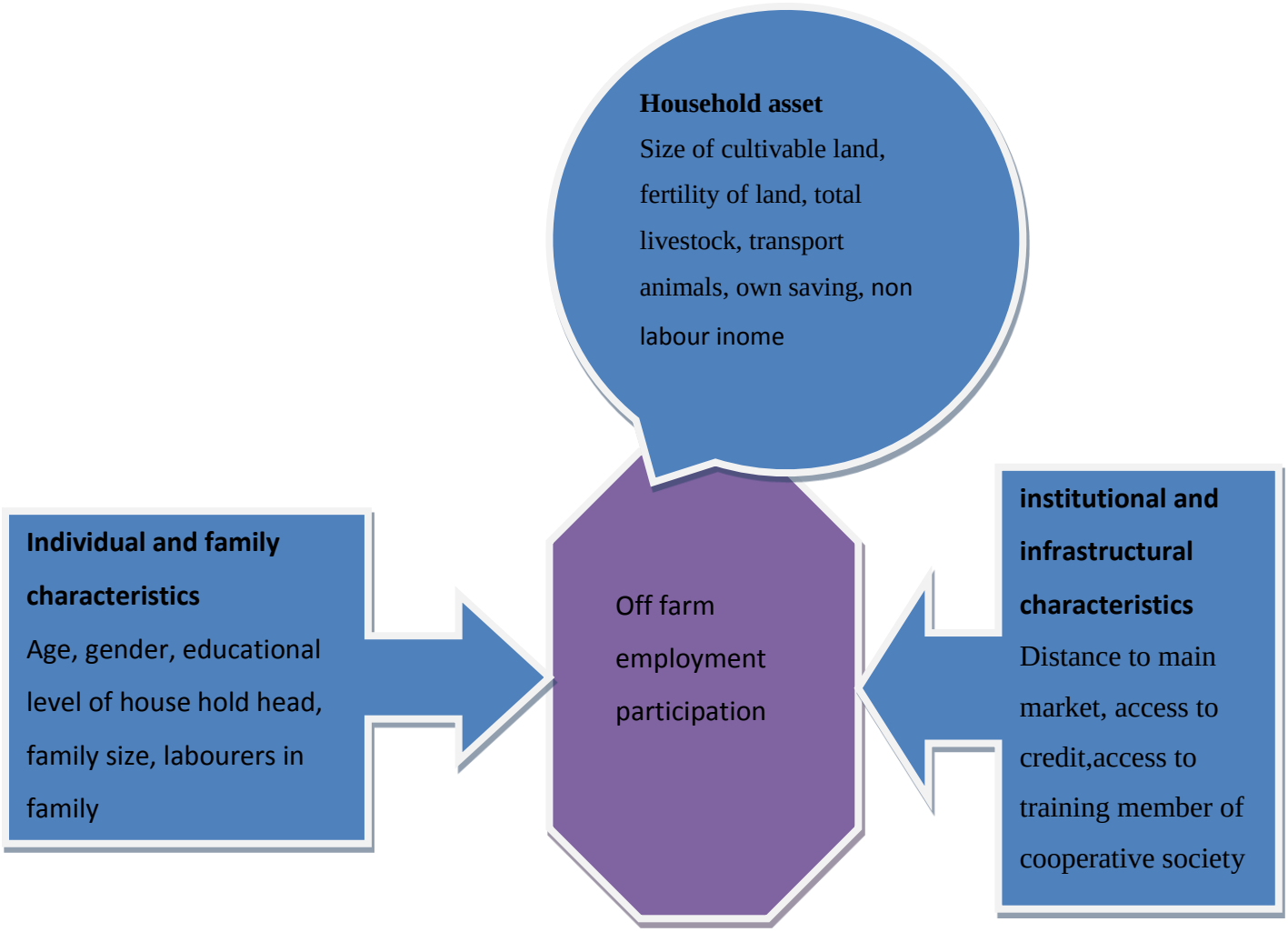
Engdayehu Zewdie and Sivakumar. S, (2018) conducted study in Shebedino Woreda of Sidama Zone, Southern Ethiopia with the main objective of analyzing the determinants of off farm participation of rural farm households based on binary logistic regression model. The finding of the study shows that among the sample of factors, off farm training, credit service, household saving, education status, presence of draft animals, size of farm land was identified as, most important determinants to influence off farm participation of the households. The result also

shows that the role of off farm activities to fulfill the livelihood needs of the farm households; food security, better health, educating children, better housing and relaxation of financial constraint are main benefits households have got from off farm income. Distance of market, shortage or lack of input and low price of the products are among main challenges that farm households face while practicing off farm activities.

2.3. Conceptual Frame Work

As different studies explain to support the research work, conceptual framework is important. Therefore, in order to provide analytical basis for determinants of farm households' participation in off farm activities the following conceptual framework is designed. The literature provide us ample evidences in favor of the explanations for farm households' motivations to diversify their employment in to off farm work. Based on this empirical review researcher present the conceptual frame work that tries to link the major factors that are expected to determine household's decision to participate in off-farm activities.

Figure 2.1: Conceptual framework for major determinants of off farm participation



source: Conceptual framework adopted from the reviewed literatures by researcher (2020)

CHAPTER 3

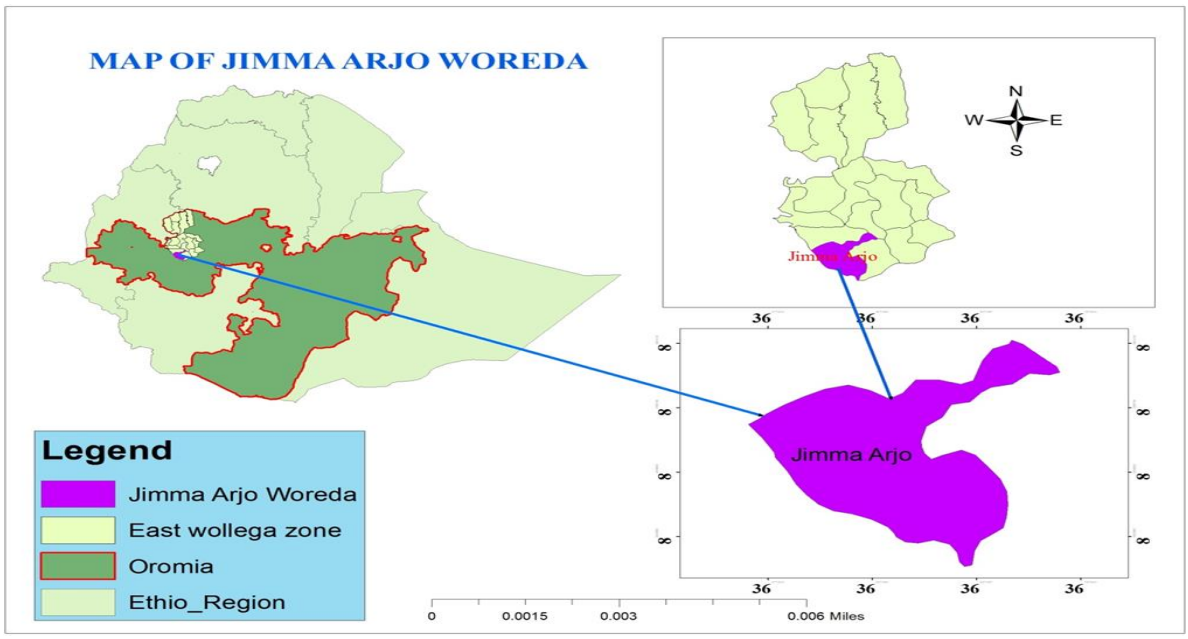
RESEARCH METHODOLOGY

3.1 Description of the study area.

The study was conducted in Jimma Arjo District, East Wollega Zone of the Oromia Regional State, which is located in the Western part of Ethiopia. It is one of the 17 districts of the East Wollega Zone. Arjo is the administrative center of the district. It is located at 379 km to the West of the capital, Addis Ababa, and 48 km south of Zone capital, Nekemt. Jimma Arjo is bordered on the South by Bunnoo Bedelle zone, on the West by Leka Dulacha district and Ilu abbabora zone, on the North by Leka Dulacha and Wayu Tuka districts, on the East by Nunu Kumba district.

The agro- ecology of the district is divided into three: Highland (dega) 15%, middle land (weynadega) 80.5% and Lowland (kola) 4.5%. The major markets ofthe district are Jimate, Arjo and kumba. Rual household nearest to those markets are highly participate in trade activity as source of income (Agricultural office of Jimma Arjo Woreda, 2020).

Figure 3.1 Location map of the study area



Source: Jimma Arjo District Agricultural Office, 2020

3.2 Research Design

In order to conduct a research on the study area, the researcher adopted a cross-sectional survey. The study population constitutes farm household head in Jimma Arjo woreda of East wollega zone. For sampling techniques, multistage sampling technique was used to select representative sample for the study. Data was analyzed using descriptive statistics and econometric model. Under econometric, logit was used. Thus, this research employed cross sectional survey research type.

3.3 Data sources and method of data collection

For this study primary data was utilized. The data employed for the study was collected from sample respondents of study area, managers of selected kebeles and woreda experts of the agricultural office. Data has been collected from the sample group through developed interview questionnaire. Interview questionnaire was the main method of collecting data from the rural households of the peasant association. It was developed on the types and characteristics of off-

farm activities existing in the study area, determinants of farm households' participation on off farm employment and the key constraints and opportunities for off-farm rural diversification in sustaining the livelihood of the rural Woreda.

To make clear and simplify for respondents, the questionnaire was translated into local language Afan Oromo. Six enumerators were appointed for the purpose of data collection. They were selected based on their experience and level of education. All field assistants/data collectors had been trained by the researcher for administration of the questionnaire to the respondents. The survey questionnaire was pre-tested before full scale of data collection in order to clarify issues in the questionnaire. Finally, data collection was made during the February of 2020.The respondents were household heads of selected kebeles (lowest administrative unit).

Interview was also held with selected kebeles' managers, and woreda administrative office. The major points of discussion were about the existing livelihood strategies, constraints and opportunities of off-farm livelihood strategies and the importance of each livelihood strategies to the rural households and for economic development. The researcher fully participated in the interview with kebele and woreda administration and closely supervised and guided the six enumerators during the period of data collection.

The study was also supplemented by secondary sources. Secondary sources were obtained from published and unpublished documents, obtained from Jimma Arjo administrative office, relevant literature and other relevant organizations. After this, quantitative and qualitative data were collected to respond the raised questions in the study area.

3.4 Sampling techniques and procedures

Jimma Arjo district rural households were used as target population for the study. From total population of this district, sample was taken from selected kebeles' farm households, since it is not applicable due to time and cost to select sample from all kebeles of this woreda.

Multi-stage sampling technique was used to meet the requirements of intended sample households. Firstly, the study area (Jimma Arjo district) was selected purposively from 17 districts of East Wollega Zone, since there is no available research conducted on off farm activity

in study area. Also, since a researcher is knowing the area very well, no communication barriers to interact with local people on issue related with research activities. In the second stage, based on the information of the district office of agriculture, researcher tried to stratify the district into 3 agro-ecological zones: lowland, medium land and highland. In the third stage, based on agro-ecological zones, 3 kebeles (Hindhe, Jarso kamisa Bera, and wayu saka) were selected from highland, middle land and lowland agro ecological zone respectively.

Lastly, simple random sampling was employed to select respondents from each stratum (selected kebeles). The size of respondents on each kebele was determined based on proportional sampling technique.

3.4.1 Sample size determination

The required sample size for collecting primary data was determined by using kothar's formula (1977). The sample size was made by assuming that 75 percent of the individuals included in the study are participated in off farm activity, with a marginal error of 5 percent and 95%confidence interval. The formula to calculate a representative sample size is shown as; n = $\frac{pqz^2}{e^2}$

Where

n =the desired sample size

Z=the standard deviation at the required confidence level

P=the estimated proportion of an attribute that is present in the population

q=1 - p

e=the margin of error

Thus, the calculation for required sample size is as follows,

p =0.75 and hence

q =1-0.75 =0.25;

e =0. 05; z =1.96;

$$n = \frac{0.75*0.25*1.96^2}{0.05^2} = \frac{0.1875*3.8416}{0.0025}$$

n = 288

Based on the stated formula, the sample size is determined to be 288 households. To determine sample size ofeach kebele, the researcher employed proportional Sampling technique. That is, if Ni represents the proportion of population (household) included in stratum i, and n represents the total sample size, the number of elements selected from stratum i is n. A sample of size n = 288 was drawn from a household of size N = 4041 which is from three Kebeles of size N1 = 1347, N2 = 1554 and N3 = 1140.

Table 3.1: Sample size by Kebele

Kebele	Total households in selected kebeles	Samlpe households in selected kebeles
Hindhe	N1 = 1347	n_1=n*N_1/N 288*1347/4041 96
Jarso Kamisa Bera	N2 =1554	n2=n*N2/N 288*1554/4041 111
Wayyuu Sakaa	N3 =1140	n3= n*N3/N 288*1140/4041 81
Total	N =4041	N = 288

3.5 Methods of Data Analysis

In this study both descriptive and inferential methods of data analysis were employed. The descriptive analysis was performed using frequencies, means, and mean differences values. Furthermore, t-test for continuous variables and $\chi 2$ test for categorical variables was analyzed. Thus, the t-test was used to test the significance of the mean value of continuous variables of the two groups of participant and non-participants. Likewise, the potential discrete (dummy) explanatory variables were tested using the chi-square (χ 2) distribution. The binary logit model with the help of STATA version 14.0 was employed to identify the determinants of the rural

households' participation in off farm employment. VIF (Variance Inflation Factor) for association among the continuous explanatory variables and contingency coefficients for categorical variables were used as tests of multi-co linearity.

3.6. Model Specification

In this case the variable *y* is an indicator variable that denotes the occurrence and non-occurrence of an event. Thus, it is a binary choice which assumes those farm households are faced with choice between two alternatives. The choice is qualitative (participant of off farm employment and non-participant). Following Green and Guajarati (1995) the logit model for factor affecting rural household participation in off farm activity was applied for the study and it is specified as follows.

Logit model

A binary logistic model using cumulative normal function and relying on maximum likelihood in estimation was employed to identify the factors influencing individuals from farm households to participate in off-farm activities. This model was selected because of its suitability for the analysis of a dummy response variable. The dependent variable in this case takes a value of 0 or 1 depending on whether a farmer is off farm participant or not. However, the independent variables are both continuous and discrete. Following Pindyck and Rubinfeld (1981), the cumulative logistic probability function is specified as:

$$Pi = F(Zi) = F = (1/1+e^{-(\alpha+\sum_{n=i}^{m}\beta ixi)}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where: Pi represents the probability that i^{th} household will make a certain choice (in this case participant and non-participant), given explanatory variables (Xi); e represents the base of natural logarithms; Xi represents the explanatory variables; mi represents the number of explanatory variables, i = 1, 2, 3 …, m; and α and βi are parameters to be estimated. Coefficient interpretation will be understandable if the logistic model is once written in terms of the odds and log of odds (Hosmer and Lemeshow, 1989). The odds ratio is simply the ratio of the probability of being participant (Pi) to the probability that he/she would be non-participant (1-Pi). But Pi is

non-linear not only in Xi but also in α and βi which creates an estimation problem. So, we cannot use the familiar OLS procedure to estimate the parameters:

But 1-Pi = $1+e^{-Zi}$……. (2)

Therefore, the odds ratio becomes: $\frac{pi}{1-pi}$ = $\frac{1+e^{zi}}{1+e^{-zi}}$ ……...(3)

$\frac{1+e^{zi}}{1+e^{-zi}}$ = $e^{(\alpha+\sum_{i=1}^{m}\beta iXi)}$ …….. …… (4)

Therefore, to get linearity, we take the natural logarithms of odds ratio equation (4), which results in the logit model as indicated below:

Zi = Ln ($\frac{pi}{1-pi}$) = α + β_1X_1 +β_2X_2 + β_3X_3+…β_mX_m ……. (5)

As P goes from 0 to 1, the logit goes from -∞ to ∞. That is, although the probabilities lie between 0 and 1, the logits are not so bounded (Gujarati, 1995). If the disturbance term Ui is taken into account, the logit model becomes:

$\boldsymbol{Zi = \alpha + \sum_{i..1}^{m} \beta iXi + Ui}$ ……... (6)

HHCAT=α+β1SEX+β2AGE+β3Edu1+β4EDU2+β5EDU3+β6HHSIZ+β7ADULT+ β8FARMSIZE+β9LANFRTY+β10TLU+β11DFANIMA+β12CREDIT+β13SAVING+β14NLINCO+β15DISTNCE+β16COPSCTY+β17TRNING +Ui……. (7)

Hence, the above econometric model was used in this study and was treated against the potential variables affecting willingness to participate in off farm employment.

3.7 Definition of variables

The major variables expected to have influence on the participation decision off farm employment are explained as follows:

Dependent: The dependent variable for logit model is participation decision on off farm employment (**HHCAT**), which is a dummy variable taking a value one (1), for participant and zero (0) otherwise.

Independent variables:

Based on empirical studies, the independent variables in this study are the determinants of off-farm work participation. The following groups of independent variables were analyzed in this study, as described below.

i. Individual and Family Characteristics

Gender of household head (GENHH). This dummy variable represents the gender segregation between men and women on household head. Men and women have different access to resources and opportunities. Women own less property compared to men and they are subject to discrimination in a variety of markets including labour markets. The study would expect that sex is positively influencing the participation of farm households in off-farm employment (Oluwatayo., 2009)

Age of household head (AGE): It is continuous variable representing the period from the respondent birth to the data collected time and is measured in years. This is used to capture the life-cycle effect on participation in off-farm work. It is expected that initially an increase in probability of off farm participation, but the effect of experience expected to reduce after some maximum point. The variable predicted parameter is expected to have a negative sign to indicate that after a certain age, the tendency to participate will decline (Ambachew and Ermiyas, 2015).

Education level of household head (EDUCLEVEL); this represents human capital endowment. It is expected that an increase in individual years of schooling will increase the tendency to participate. More years of schooling lead to a higher probability of working outside the agricultural sector. People with more vocational training or tertiary education often have more employment options. The variable predicted parameter is expected to have a positive sign to indicate direct relationship of the variables(Freese, 2010).

Family size (**HHSIZ)** –It is a continuous variable measured by the number of individuals living together within one home. This study expected that there is positive relationship between household size and the choice off farm livelihood strategies. (Brien. O and Hennessy, 2006)

Number of working age adults (ADULT): Number of people whose age from 16 to 65 and not attending school. A larger number of working-age adults in the family would lead to a higher probability of taking off-farm jobs, since the amount of time needed for the farm is almost fixed.

ii. Households' asset variables

Farm size (FARMSIZE); this is the size of any farm land owned by the household, in hectares. Besides capital, this variable indicates land ownership, which reflects asset holding related to poverty. It is assumed that a small farm size is related to a poor farm household and vice versa. Thus, it is expected that off-farm participation is less likely to be favoured by individuals owning larger farms. (Sharad, 2006).

Fertility/quality of land (LANFERTY):it is a farmer' Perceptions about the soil quality and productivity of land in relation to the neighbour farmers' land. The more the farmer perceives good quality soil (both in terms of fertility and slope) the less will be the tendency of participating in off farm activities. Thus, we expect negative and strong correlations among these variables.

Number of livestock (TLU): It is measured by Tropical Livestock Unit (TLU). Owners of large number of livestock are often rich, have access to more resources. It was thus assumed to be negatively associated with off farm participation.

Draft animals (DFANIMA): It is about rural households having transport animal**s.** Having transport animals such as donkey, mule, horse and any other animal used for transportation may help farmers to participate in off farm activities. Thus, it was expected that it positively affects participation(Berg and Kumbi , 2006)

Saving (SAVING): Saving is dummy variable showing whether households practiced saving or not. Thus, households having their own saving are more likely participate in off farm activities

than those households who do not. Thus, it is hypothesized as having positive relation with farmers' participation in off farm activities.

Non labour income (NLINCO); this is defined as all other non-labour income, including pensions, insurance benefits, transfers, remittances, bonuses and other. It is expected that Individuals with higher non labour revenue are expected to be less likely to participate in off-farm work.

Iii.Infrastructures and Institutional variables

1.Credit (CREDIT); Is the main source of funds for rural households who lack asset to enter into new business. The single most commonly reported obstacle to investment and entrepreneurship is inadequate access to capital, however, demand constraints may also be a factor underlying restricted access to credit. Thus, credit is expected to have positive impact on rural households' participation in off farm employment (Beyene, 2008).

Access to training: Is all available training access to the farmers on means of enhancing skill of livelihood strategies. It is expected to have a positive effect on households' participation decision in off-farm employment opportunities.

Distance to market (DISTNCE); is a distance (measured in hours) from the farm residents to the nearest market. It is expected as a long distance from the farm to the nearest market may reduce the probability of working off farm. Therefore, distance to the nearest town center is expected to negatively affect a rural household's off-farm participation. With more off-farm opportunities in populated areas, people living closer to the town are expected to have a higher off-farm participation rate. Thus, the more time needed to reach at the main marketing places, the more difficulty that the farmers may participate in off farm employment(Theodros, 2012)

Membership in other cooperatives societies (COPSCTY): Is participation in different farmers associations such as unions and cooperatives are expected to increase the information flows among the farmers and may enhance farmers participation in off farm employment.

Table 3.2 both dependent and independent variables and their expected relation

Variables	**Description and measurement**	**nature**	**Expected sign**
HHCAT	1, If the household participates in off farm activities, 0 otherwise	dummy	Not applicable
GENHH	1, If the household head is male, 0 otherwise	dummy	+
AGE	Age of household head in year	continuous	-
EDUCLEVEL	0=illiterate,1=informally literate, 2=primary education,3=secondary education and above	ordinal	+
HHSIZ	number of family size	continuous	+
ADULT	Number of people whose age from 16 to 65 and not attending school	continuous	+
FARMSIZE	Size of arable land in hectares	continuous	-
LANFERTY	1, if households' land is rich in fertile,0 otherwise	dummy	-
TLU	Number of total livestock owned by respondents	continuous	-
DFANIMA	1, if household has draft animals for transportation, 0 otherwise	dummy	+
CREDIT	1, if the farming household has access to credit, 0 otherwise	dummy	+
SAVING	1, if the farm household has his/her own saving, 0 otherwise	dummy	+
NLINCO	1, if household head has non labour income, 0 otherwise	dummy	-
DISTNCE	Time spent by households to reach major market	Continuous	-
TRNING	1, if the household head has access to training,0 otherwise	dummy	+
COPSCTY	1, if the household head has a membership of cooperative society, otherwise 0.	dummy	+

CHAPTER FOUR 4

RESULT AND DISCUSSION

4.1 Introduction

This chapter presented and discussed findings regarding the smallholder farmers' off farm participation decision and the contribution of off-farm activities existing in the study area. To this end, findings from descriptive and econometric analyses were presented and discussed. The econometric analysis was used to identify determinants of rural households' participation decision. Before discussing the econometric results, some descriptive statistics were presented.

4.2 demographic and socioeconomic characteristics of sample respondents

Both continuous and discrete variables were used in order to describe the sample households included in this study. The study employed independent t-test and chi square test to make a comparison (to make sure the presence or absence of difference) between the off farm participant and non-participant households.

4.2.1 Comparison of participant and non-participant households using continuous explanatory variables

The mean values of continuous variables in the two categories were compared using independent t-test. Table 4.1 shows, the mean differences between the participants and non-participants in study area, which were significantly differ in age of household head, family size, labourers of family, land size, total livestock unit and distance to the major market center.

Table 4.1 Descriptive statistics of sample households (for continuous variables)

	Respondents (N=288)		Non-participants (N=88)		Participants (N=200)			
Variable	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev	mean diff	t-test
AGE	47.0173	9.1862	53.636	.9482677	44.105	7.6948	9.531364	9.2227***
HHSIZ	6.7708	2.3716	5.0909	1.927635	7.51	1.8835	-2.41909	-9.968***
ADULT	3.78125	1.6688	2.7272	1.247778	4.245	1.35801	-1.51772	-8.951***
FARMSIZ	1.50868	.99778	2.1193	1.2965	1.24	.68078	.879318	7.5278***
TLU	6.89158	3.6456	3.6588	2.61767	8.1795	3.2322	-4.515	-11.58***
DISTNCE	1.81197	.94981	2.2511	.830315	1.6187	.936413	.6323864	5.4598***

(Source: STATA result, 2020)

*** Significant at 1% probability level

The results from table 4.1 showed that the average age of the respondents is 47 years. It also found the mean age of participant households (44.11 years) which is less than the non-participant households (53.63 years). An independent sample t-test was conducted to compare the difference in mean age between participant and non-participant sample respondents which was statistically significant at 1% probability level (t =9.22). The significance mean difference of the computed household head's age between the two groups implies that the participants were younger than the non-participants.

The mean family size of the study areas sample households was found to be 6.77. An average of family size for participant and non-participant households were 7.5 and 5 respectively. The analysis(t=-9.96) also shows that, the mean difference between participant and non-participant households on off farm employment with respect to family size is found to be statistically significant at less than 1% probability level. This revealed us that, participant households had larger family size than non-participants.

Moreover, in the study area, an overall average of family labor of the respondents was 3.78. A mean of participant and non-participant farmers amounts, 4.25 and 2.73 respectively. An independent sample t test was analyzed to compare the mean difference between the participant and non-participant households on off farm employment and the result shows statistically significant at 1% probability level (t =-8.95). The significance means difference of the computed family labor between the two groups implies that the participant has more family labors (member of family aged between 15 and 65 years and not attending school) than the off farm non-participant.

Land: Land is a base for any economic activity, especially in rural and agricultural sector. In the study area, the average land size owned by non-participants and participants were 2.12ha and 1.24ha, respectively. The overall average land size of the respondents was 1.509ha. The result of the t-test depicted that the mean difference between the two sample groups about the size of cultivated land holding was statistically significant at 1% significance level. This indicates that, the average land size of non-participant households was higher than that of participants.

In the study area, farmers undertake mixed farming where, livestock rearing is one of the important components. To indicate the livestock holding, conversion factors to estimate Tropical Livestock Unit was calculated (Table 1 in the appendix). The average livestock population held by the sample household was 6.89 in TLU. The mean number of livestock owned by non-participant and participant households was 8.18 and 3.66 TLU, respectively. The mean difference between the participant and non-participant groups regarding the size of livestock was statistically significant at 1% level of significance.

The mean time it takes to reach the main market for the sample households is 1.81hours. The mean time it takes to the nearest market for participant households was less than the mean time it took for non-participant households. To reach the nearest major market (woreda market) from individual's residence on average, it takes 1.62 hours for participants and 2.25 hours for non-participants on off-farm employment opportunities to draw their livelihood. From this, the researcher concluded that, non-participant households are located in remote areas.

In general table 4.1 shows, the mean differences between the participants and non-participants were significantly differ in age of household head, total family size, number of workers(adults) in family, size of owned land, total livestock and distance to the nearest main market. On average, participant households have smaller size of land but larger number of total livestock as well as larger laborer and family size. Compared to non-participants, participant households are youngsters and living nearer to market place. All the variables described are statistically significant at ($p<0.01$) between participant and non-participant households.

4.2.2 Comparison of participant and non-participant households using discrete explanatory variables

Sample households' distribution by their demographic and household assets characteristics:

As indicated in table 4.2, out of the total sample under consideration, with regard to gender of household heads, male headed households accounted for approximately 94.79% and the remaining 5.21% households were headed by female. The result also shows that from the participant households, (99.5%) were male-headed households and 0.5% were female. On the other hand, 84.09% of non-participant households were headed male households, whereas 15.91% of nonparticipant households were female. The chi-square test (29.39) portrays the existence of statistically significant difference between the two groups of households with respect to the sex of household head at 1% probability level. This implies that, male was more participated in off farm activities than female in the study area.

Education of household head: Haile, (2008) suggested that education helps to arm people with the necessary skills and knowledge to actively participate in different economic activities of their surroundings, and promote entrepreneurship. Table 4, out of the total sample households, 35.5% of the participants and 20.45% of non-participants received informal education. Similarly, 25.5% of participants and 23.86% of non-participants received primary school education level. Besides, 7.5% of the participants and 3.41% of the non-participants have acquired secondary and above, education level. This shows, that the proportion of educated respondents is greater in off farm

participant households than that of non-participants. ($\chi 2$ =6.4785) shows an existence of statistically significant between off farm participant and non-participant group at 5% probability level in-terms of education level of they acquired.

Table 4.2: Descriptive statistics of sample households (for discrete demographic and household asset variables)

Variable	response	Non-participants		participants		Chi-square value
		Frequency	Percent	Frequency	percent	
Sex of household Head	female Male	14 74	15.91 84.09	1 199	0.5 99.5	29.39***
Education of HHH	Illiterate informal education Primary education 2ndary education And above	46 18 21 3	52.22 20.45 23.86 3.41	63 71 51 15	31.5 35.5 25.5 7.5	6.4785**
Quality of land	Poor fertility Moderate(rich) fertile	35 53	39.77 60.23	167 33	83.5 16.5	55.79***
Has transport Animals	No Yes	69 19	78.41 21.59	97 103	48.5 51.5	24.17***
Has book account	No Yes	7 0 18	79.54 20.45	62 138	31 69	58.0101***

*** Significant at 1% significant level

Source: computed from own survey data, (2020)

Apart from land size, quality of land is an important attribute of productivity and then one of the factors affecting farm households off farm participation. The sample respondents were asked about fertility soil of their land. From the total participants, 83.5 % of them reported that their land is poor in soil fertility and remaining 16.5%reported opposite. However, majority of non-participants (60.23%) of them reported that their land is moderately/richly fertile and the left 39.77% of them reported as their land is poor in soil fertility. This revealed that farmers owned fertile land have less probability of participation on off farm employments. Similarly, the result

of $\chi 2=79.6143$ shows the existence of statistically significant difference between the two groups of farm households.

Draft animals; is pack animals such as donkeys, horses, and mules which used for transporting loads and human beings. So, they are used in trading activities which are an important source of income for farmers and one of off farm employment in the study area. The chi-square result ($\chi 2=49.37$) shows the presence of statistically significant differences between participant and non-participant farmers at 1 percent probability level in terms of having transport animals. This shows us farmers owned transport animals have high probability of participation on off farm employment.

Saving; was one of the economic variables hypothesized to influence rural households' participation in off farm employment. From the participant respondents about 69% of them practiced saving and only 31% of participants were didn't practice saving. From the non-participant respondents, 79.45% of them didn't practice saving, but 20.54% of them practiced saving. The chi-square analysis portrays the existence of statistically significant differences between the two groups at 1 percent probability level ($\chi 2= 58.01$). This implies farmers who practiced saving are more likely to participate in off farm employments.

Table 4.3: Descriptive statistics of sample households in terms of social and institutional characteristics

		Non-participants		Participants		
variable	response	Frequency	Percent	Frequency	percent	Chi square
Access to credit	No Yes	79 9	89.77 10.22	45 155	22.5 77.5	112.80***
Access to training	No Yes	51 37	57.9 42.05	159 41	79.5 21.5	14.3649***
Access any non Labour income	No yes	46 42	52.27 47.72	173 27	86.5 13.5	39.2967***
Membership in Cooperative	No Yes	53 35	60.23 39.77	51 149	25.5 74.5	31.944***

*** Significant at 1% significant level

Source: computed from own survey data, (2020)

Another barrier of participation is the lack of credit. Access to credit refers to provision of credit for the farm households.Access to credit can relax farmers' financial constraints to do things in a way they consider paying.The results of $\chi 2=112.80$ showed an existence of statistically significant difference between the two groups.This revealed that the participation decision on off farm employment can be determined by access to credit since household with access to credit has high probability to be participant of off farm employment.

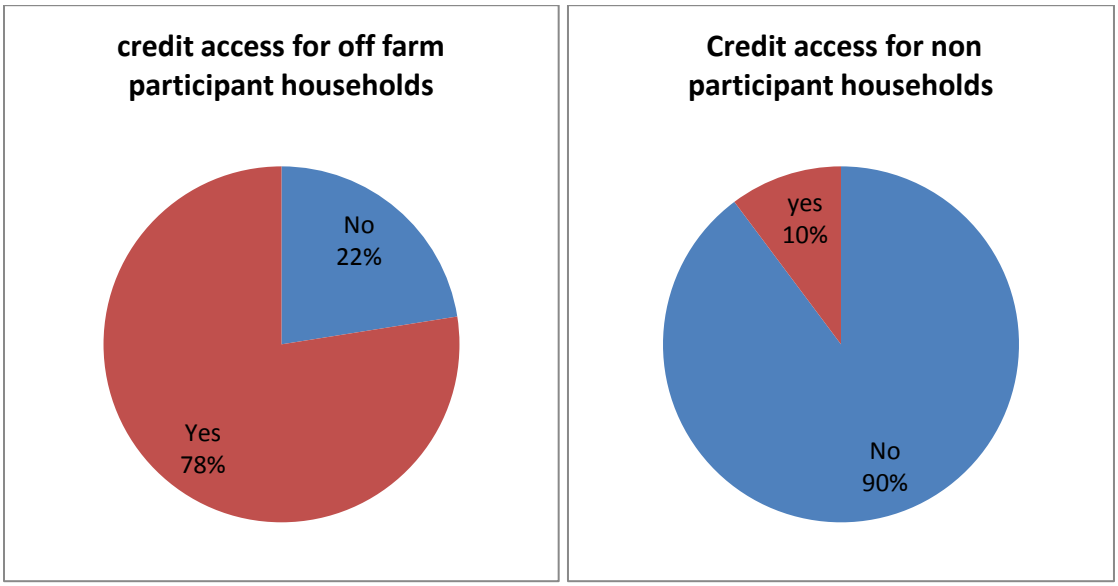


Figure 4.1 access of credit for non-participants Figure 4.2accessibility of credit for participants

The distribution of total sample respondents in terms of access to credit showed that 90% of non-participant farmers had no access to credit services while only 22% of participant farmers didn't have credit services. In terms of credit obtained by respondents, 78% of participants got credit services, however, only 10% of non-participant got the service. The percentage of respondents' access to credit was high in off farm participant individuals than nonparticipants (Figure 4.1 and 4.2). This indicates that Farmers those access credits were highly participate on off farm employment.

Membership to cooperatives: is an important social capital that promotes sharing of knowledge, information, experience and etc., among households about the value of engaging in

off-farm activities. In addition, being a member of a group (cooperatives) opens a means of gaining off-farm employment opportunities. This variable found to have ($\chi 2$=31.944) which portrays presence of statistically significant difference between the two groups in terms of this variable at less than 1% significance level.

Respondents were also asked about, non labor income and access to training and the result showed that those variables were also statistically significant at 1% significant level with their ($\chi 2$=14.3649 and 39.2967) respectively. More specifically, the test revealed that there was a significant difference between those households who were participants in off-farm employment opportunities and non-participants in terms of access to training and non labor income.

4.3 Sample household participation on farm and off farm employment in the study area

Table 4.1 shows the proportion of rural households; those choose farm only, off farm only and farm plus off farm livelihood strategies in three stratified agro-ecology. From the total respondents, 69.44% of them choose to participate on off farm activities. But the remaining 30.05% were non-participant households. Majority of non-participants in off farm employment were from lowland agro-ecological zone (33.33%) followed by middle land (31.53%) and highland (27.08%) in comparison of agri-ecological zone. Inversely, among the off-farm participant households in each of agro-ecological zone, highland was the highest (72.92%) followed by middle land (68.47%) and lowland (66.67%). From the above statistical result, it is possible to conclude that in highland there would be more push or pull factors of rural households to participate on off farm employment than in others agro-ecological zone.

Table: 4.4 Sample household participation on farm and off farm employment in study area.

Activity	Agro-ecological zone							
	Highland		middleland		lowland		total	percent
	Frequency	percent	frequency	percent	frequency	percent		
Farm only	26	27.08	35	31.53	27	33.33	88	30.05
Farm and off farm	70	72.92	76	68.47	54	66.67	200	69.45
Total	96	100	111	100	81	100	288	100

Source: computed from own survey data, (2020)

4.4. Types of Off Farm Activities Practiced in Study Area

In the study area farm households were engaged in different types of activities that are practiced for fulfillment of livelihoods of farm households. Off farm activities are among the major activities that supplement farm income. Table below summarizes types of the off-farm activities mostly practiced in the study area. As shown in the table, households have been participating in two categories of off farm activities, namely self employment and wage employment.

Table: 4.5 Off-farm activities in the study area

Self employment activities	frequency	%	Wage employment	frequency	%
Sale of local food and drinks	21	14.79	Causal agricultural	6	10.34
Local trade	41	28.87	Religious worker	8	13.79
Selling firewood and charcoal	6	4.23	Government organization	17	29.31
Handicraft and weaving	16	11.27	Daily wage work	15	25.86
Carpentry and forest products	8	5.63	Food- for-work	2	3.44
Animal drawn carts	5	3.52	trader (private sector)	11	18.96
Animal Fattening	25	17.61			
Milling and tailoring	5	3.52			
hair dressing	7	4.93			
Shopkeeper	8	**5.63**			
Total	**142**	**100**	**Total**	**58**	**100**

Source: computed from own survey data, (2020)

About 69.44% of the sample households reported that they participated in off-farm activities (both in wage employment and self-employment), out of which, 49.31% were participate in off farm self employment and the remaining 20.14% were in off-farm wage-employment. Since

participation in off-farm activity is depend on family labor, which is also used for on-farm activities, the complementary nature of off-farm employment to farm employment is likely to depend on agricultural conditions. In the face of acute weather variability, off-farm activities could become attractive adaptation options to agricultural activities. This indicates why majority of respondents participate in self employment off farm activities since wage/salary employment cannot be available when farm households want to work in slack seasons.

As shown in Table 4.5, the most common types of off farm self employment, in terms of participation is local trade (28.87. %) followed by animal fattening (17.68%), Sale of local food and drinks (14.79%), Handicraft and weaving (11.27%), Carpentry and forest products (5.63%), **s**hopkeeper (5.63%), hair dressing (4.93%) and the others constitute the remaining. Similarly, the major types of wage employment include government organization (29.31%), daily wage work (25.86), for individual trader (18.96), religious worker (13.79), causal agricultural (10.34) and food- for-work (3.44).From this result the researcher concludes that, most commonly practiced off farm in study area are; local trade , animal fattening and Sale of local food and drinks from self employment and government organization,daily wage work and work for individual trader especially in rural town are from wage employments.

4.5 The Patterns of household participation in off farm work and contribution of off-farm activities existing in the study area.

4.5.1 The Patterns of household's participation in off farm work

Table 4.6 patterns of households' participation on off farm employment

Patterns of participation in off farm livelihood	Frequency (N=200)	Percentage (%)
Temporarily/causally	40	20
Seasonally/as a par time activity	91	45.5
Permanently	69	34.5

Source; computed from own survey data,2020)

Patterns of participation on off farm activity shows, how often households are participating on any type of off farm employment. Table 4.6, portrays the distribution of the off-farm participant households with respect their patterns of participation on off farm employment. Of 200 participant farm households 45.5% of them were engaged in off farm livelihood depending on season and as par time activities. These respondents were also asked, reasons for their choice of this pattern of participation and most of them were replied, seasonality of agriculture, as cause for their seasonal participation, because of they were busy in farm during peak season. This indicates that, majority of seasonally participant households are involved in off farm employment during off season as well as before and after of farming activity.

From the remaining participants, 34.5% of them reported that, they were permanently participated on off farm employments. This is due to limited farm land to give job opportunity for family labour as it was reported by most of permanently participant farm households. The left 20% of off farm participant farm households, reflected that they were temporarily participated on off farm activity. These participants were also asked why they were temporarily/causally involved on this work and most of them reported due to unavailability of off farm job around their residence.

4.5.2 Contributions of off-farm activities existing in the study area.

Respondents were asked about the main benefits of off farm employment and they were listed as they got the following advantages like additional employment, learn new skills, increase purchasing power/ relaxation of financial constraint, food security, better health, educating children and better housing. The foregoing interview has also revealed that, off farm activity is an important part of livelihood diversification. It provides employment for surplus labour in two

senses. Firstly, it can provide employment to individuals who would otherwise be unemployed, and secondly it can provide additional employment for that whose main employment are not full-time and/or does not provide an income sufficient to bring the household out of poverty.

Interviewees also gave knowledge they have about off farm activities; as these activities can provide employment, main or supplementary, for a growing number of youth as well as for small farm households in rural areas of the the district. It can possibly provide one important route out of agricultural work and generally provide a higher standard of living than enjoyed by those dependent on agricultural employment alone. However, it is important not to see them in isolation from agricultural employment. In rural areas agricultural and off-farm employment are linked through production and consumption. Both are part of livelihood strategies at both the individual and the household levels in rural areas.

Moreover, evidences from interview stated that off-farm economy can make a major contribution to the incomes and welfare of rural households, thereby pulling rural households out of poverty. The sector contributes considerably not only to rural development and ending rural poverty, but also it can help transform an agrarian rural economy to one that is more diversified in rural areas, and increasingly integrated with the urban economy.

4.6 Major reasons for participating in off-farm activities

Depending on the response of the respondents; Decisions by rural households concerning involvement in off farm activities depend on two major factors: these are push and pull factors.

Table 4.7: Reasons for participating in off-farm activities

push factors and pull factors	Frequency	Percent
push factors		
Limited farm income	48	24
To support livelihood	39	19.5
Inadequate land to cultivate	43	21.5
Large family size	28	14
Seasonal nature of agricultural labor	10	5
Sub total of push factors	**168**	**84**
pull factors		
Off-farm work is more rewarding than farm work	15	7.5
the wage differential between the two sectors	8	4
the riskiness of each type of employment	6	3
Availability of off-farm work opportunities	3	1.5
Sub total of pull factors	32	16
Total	200	100.0

Source: computed from own survey data, (2020)

Majority of rural households **(**84**%**) of participants are pushed to off-farm activities to meet their needs and offset income shortfalls. 24% of them were forced to participated on off farm employment due to limited farm income followed by inadequate land to cultivate (21.5%), to support livelihood (19.5%), large family size (14%) and seasonal nature of agricultural labor (5%). This portrayed that most of the sample households were participating in off-farm activities mainly to supplement their agricultural income, since production and productivity of agricultural sector is low and farm household income is not sufficient even to feed their families. Excess labor in the family and the seasonality of agriculture are also factors responsible for farmers to participate in off-farm activities.

Interview stated about the reasons of farm household participation on off farm employment as follows. Firstly, it stated large family size results in declining farm size which in turn result in low level of per capital production and hence less income by which farm household cannot survive, so they are forced to engage on off farm employment. The next reason stated by interview is seasonality of agriculture which causes a farm household to have excess labor during the slack season and induces them to take on in off-farm activities.

The remaining rural households (16%) make a positive choice to take advantage of opportunities in the rural off farm economy. 7.5% of them taking into consideration off-farm work is more rewarding than farm work followed by availability of off-farm work opportunities, the wage differential between the two sectors and the riskiness of each type of employment.

Interview was also undertaken to collect an information concerning factors enforcing farm households to participate on off farm employment and it shows various risks like drought, snow, crop and animal disease, shortage of grazing land for animals, low fertility of soil, inappropriate rainfall, lack of water for irrigation and high population growth as a major reasons of farm households off farm participation. This implies that most rural households choose off-farm activities as a result of push factors which mainly targets on reducing the risks associated with agriculture to smooth consumption at a period of low agricultural production or to reduce vulnerability to shocks.

4.7 Barriers to participate in off farm employment

Identified questionnaires were prepared for non-participant households to get the reason why they are not participating in off farm activities. As their responses majority of them had an interest to participate; however, they constrained by different factors. Table below shows those factors being barriers for households.

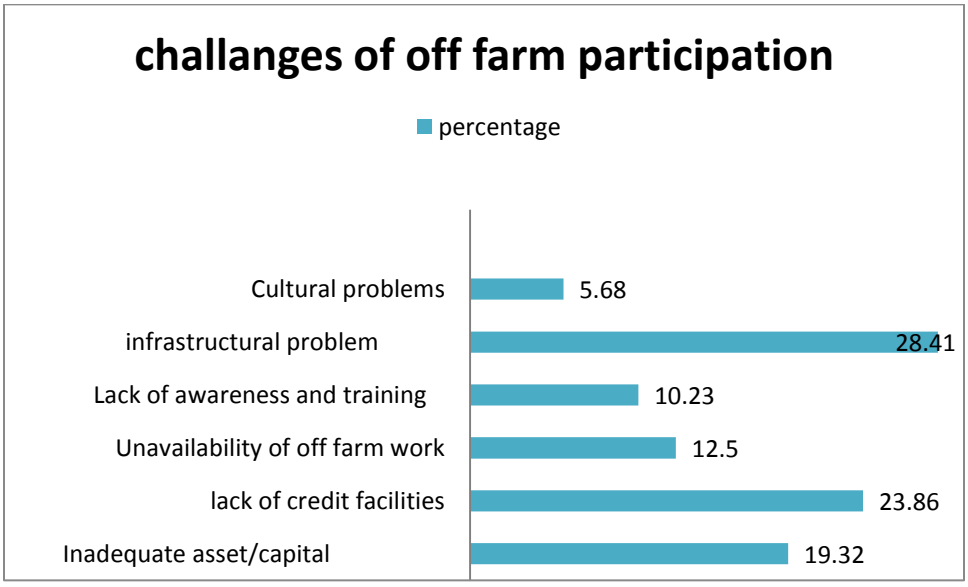


Figure 4.3 Challenges of participation on off farm employment

Source: computed from own survey data, (2020)

Farmers in the study has been facing numerous constraints. The above figure shows the key reasons reported by non-participant respondents why they were not participated in off-farm activities. As it is shown on the figure 4.3, non-participant households were constrained to undertake off farm activities mostly due to infrastructural problem (28.41%) followed by the second reported obstacle for participation was lack of credit facilities (23.86%).

In addition, inadequate asset/capital (19.32%), unavailability of off farm work (12.5%), lack of awareness and training and cultural problem (5.86%) were appear to be barriers to rural households' participation in off farm employment in study area. This revealed that majority of rural households have an interest to participate in off farm activity, however they were unable to participate because of above listed problems. Despite they have an interest to undertake in off farm employment, there is also lack of awareness and training on activity from concerned bodies.

The information collected through interview stated that due to gender division of labor; petty trade and food processing is mainly done by females. It also argues that the farmers do not choose off-farm activities due to it requires high capital, skill and knowledge. Moreover, foregoing interview also indicated, farmers don't choice some off-farm activities due to products produced by engaging in these activities were not competitive to the manufactured products.

4.8 Results of the Econometric Model

4.8.1. Determinants of farm household participation

For the present study, Binary Logit Regression Model was used to identify the determinant variables of farmer participation. In the following section, procedures to select independent variables and results of logit regression analysis conducted to identify determinants of farmers off farm participation in Jimma Arjo woreda were presented.

4.8.2 Data cleaning and management

The problems of multicollinearity and hetroscedasticity are exist in cross section data. Therefore, the data should be cleared before it used for the analysis purpose. The problem of heteroschedasticty was tested using the breusch- pagan test and it resulted in an existence of heteroschedasticty, because, for logit model it is difficult to say data is free from hetroskedasticity problem. Thus, we assumed the presence of hetroskedasticity and applied robust during analysis to correct the problem for the participation equation. However, the problem of multicollinearity is detected by looking VIF for continuous independent variables and at the correlation matrix between the discrete variables.

Multicollienarrity

Prior to running the Logit model, the presence or absence of multicollinearity have to be checked. There are two measures that are often suggested to test the existence of mulitcollineality. These are: Variance Inflation Factor (VIF) for association among the continuous explanatory variables and Contingency Coefficients (CC) for dummy variables. The larger the value of VIF, the more "troublesome" or col-linear the variable Xi is. As a general rule, if the VIF of a variable exceeds 10, there is multicollinearity. According to Gujarati (2003), to avoid serious problems of multicollinearity, it is quite essential to omit the variable with value 10 and more from the Logit analysis. Thus, the Variable Inflation Factor (VIF) was employed to test the degree of multicollinearity among the continuous variables. The values of the VIF for six continuous variables were found to be small (i.e VIF values less than 10) indicating that the data have no serious problem of multicollinearity, (see Table 2 in the appendix). Hence, all the six continuous explanatory variables were retained and entered into the Binary Logit analysis.

Similarly, Contingency Coefficients were computed from survey data to check the existence of high degree of association problem among discrete independent variables. The decision rule for Contingency Coefficients states that when its value approaches 1, there is a problem of association between the discrete variables, i.e., the values of contingency coefficients ranges between 0 and 1, with zero indicating no association between the variables and the values close to 1, indicating a high degree of association.

The result of the Contingency Coefficient, (Table 3 in the appendix), reveals absence of multicollinearity or high degree of association problem among independent variables. All the screened variables, therefore, were decided to be included in the model analysis. The dependent variable is the major determinants of farmers' off farm participation and Logit model was employed to estimate the effects of the hypothesized independent variables on farmers' off farm participation.

In doing so a total of fifteen independent variables were included in the model. These are; sex of household head, age of household head, education level of household head, family size, labourers in family, farm size, farm fertility, total livestock unit, having transportation animals, access to credit, saving, time spent to reach main markets, access to training, access to non labour income and membership to cooperative society. But, regardless of their importance and their significant relationship, some of the variables were excluded due to the instability they created in the model. The included variables were selected, based on literature, observation and the relevance of the variables. Further more; they were selected by testing significant differences of the mean using t-test and $\chi 2$-test.

Table 4.8 Binary Logit Estimates of the determinants of Off-Farm Employment

Logistic regression Log likelihood = -32.734734	Number of obs = 288 LR chi2 (17) = 289.06 Prob > chi2 = 0.0000 Pseudo R2 = 0.8153		
Explanatory variables	**coefficient**	**P>|z|**	**Marginal effect**
AGE (age of household head in year)	-.1240808	0.005	-.0015064***
SEXHH (sex of household head)	3.519915	0.027	.248989**
EDU1(dummy for formal education)	1.886161	0.039	.018435**
EDU2(dummy for primary education)	2.360665	0.015	.0198458**
EDU3(dummy for secondary education	.7388081	0.610	.0066779
HHSIZE (family size in number)	.4589893	0.006	.0055722***
ADULT (number of family labour)	.5126189	0.089	.0062233*
FARMSIZ (owned farm size in hectare)	-1.538259	0.001	-.0186748***
LANFERTY (dummy for land fertility)	-1.4962	0.078	-.0181652*
TLU (Total Livestock Unit)	.4064227	0.000	.0049341***
DFANIMA (dummy for transport animal)	.9200033	0.304	.0107404
CREDIT (dummy for access to credit)	2.1153	0.015	.0348703**
SAVING (dummy for saving practice)	2.28905	0.017	.0368862**
TRNING (dummy for farmer training)	-2.626839	0.008	-.0718375***
DISTNCE (time spent to reach major market)	-1.722141	0.002	-.0209072***
NLINCO (dummy for access to non labour income)	-.16267	0.852	-.0020602
COPSCTY (membership of cooperative society)	.4313177	0.589	.0055261
_cons	2.895779	0.434	

(Source: STATA result, 2020)

***, ** and* represent significant at less than 1%, 5%, and 10% probability level, respectively

Log likelihood is =-32.734734, Likelihood Ratio (LR) Chi-Square is 289.06 and its respective P-value (LR) is 0.0000. These indicate that explanatory variables included in the model had a

significant effect on household participation on off farm employment. The Pseudo R-Square is 81.53 percent and it is also an acceptable level, implying that the model's estimates fit the data.

4.8.3 Interpretation of empirical results and discussion

From table 4.7 it is possible to draw conclusions about the magnitude and direction of each variable on the probability of working off farm. As indicated in the previous section, a number of independent explanatory variables (demographic, socio-cultural, wealth-related and institutional characteristics) were postulated to influence farmers' off farm participation. Out of fifteen explanatory variables hypothesized to affect farmers' participation, twelve were found to be statistically significant. These factors include age of household head(AGE), sex of household head(SEXHH), family size (HHSIZ),household labour (ADULT), land size in hectares(FARMSIZ), fertility of household's land(LANFERTY),education level of household head (EDU1,EDU2), livestock holding (TLU),access to credit (CREDIT),saving of household head(SAVING),time spent to reach main market(DISTNCE), and access to training(TRNING) were significant determinants of off farm employment choice up to 10% level of significance. But the rest variables were insignificant.

Ten of the significant variables were found to be statistically significant with expected signs. Accordingly, age of household head (AGE), owned farm size (FARMSIZ), soil fertility of household's land (LANFERTY), time spent to reach main market (DISTNCE) were negatively and significantly related with farmers participation. Sex of household head (SEXHH), education level of household head (EDULVEL), household labour (ADULT), access to credit (CREDIT) , saving of household head (SAVING) and time spent to reach main market(DISTNCE were positively and significantly related with off participation as they were expected previously. However, total livestock owned (TLU) was positively and significantly related with participation and access to training (TRNING) was negatively and significantly related with farmers' participation in opposite of their previous expectation. To the contrary and as opposed to the expected, owning transportation animals (DFANIMA), access to non labour income (NLINCO), and to be member cooperative society (COPSCTY) were not significantly related to farm household's off farm participation.

Sex of household head (SEXHH): sex of household head had a positive effect on households' participation in off farm employment and it was statistically significant at 5% significance level. The marginal effect of sex was 0.249. The value of marginal effect indicates that Male headed households are more likely to participate on off-farm employment than the female headed counterparts by 24.90 percentage points, holding another variables constant. This might be because of two possible reasons. First, gender-based favoritism widely exists in rural areas, where girls are often discouraged to attend school and they have to bear a larger burden of housework. Second, many wages off-farm jobs are non-technical jobs which prefer males. Similarly, Yishak et al (2014) indicated that households headed by females are less likely to participate in off-farm activities than male headed households. However, the result is not in line with the study by Ashebir Demie and Negussie Zeray (2015).

Age of household head (AGE); With regards to individual characteristics, age has significant effect on participation decision of off farm employment. The probability of participation in off-farm employment significantly decreases with age of the household head at 1% probability level. The marginal effect for age implies that as age of the household head increases from its mean value 47. 02 to 48.02 years, the chance of being involved in off-farm employment will decrease by 0.15 percentage points, while other variables are kept at their mean. The negative association indicates the preference of the younger households for off farm jobs. Households' heads with one more year of age are more likely to refrain from joining the off-farm jobs compared to their younger neighbours. This is in line with most previous empirical results (Fikru 2008, Innocent and Young, 2004, Seid Sani, 2017).

Education level of household head (**EDU1, EDU2 and EDU3):** Educational status of the household head is one of the important determinants of the off-farm participation in study kebeles. the result presented the education level of the household head had a positive effect on the probability of participation in off farm employment. But the significant level was different with different levels of education. Here, from education category, illiterate was taken as the base category. Both informal education and primary education is found to be significant at 5% level. The result for the marginal effect shows, farm household head, who attain informal education

and primary education have 1.84 and 1.98 percentage points more probability of participation in off-farm employment respectively, than the illiterate counterparts, keeping other regressors at their mean. The outcome portrays that, households with informal and primary education have significantly higher probability of participation in off-farm work over the illiterate households This result, proves that, educated households have greater probability of participating in local off farm activities than uneducated households. This result is consistent with the study by (Amare and Belaineh, 2013, Melese Abebaw, 2017).

However above primary education (EDU3) is insignificant to affect farmers choice of off farm employment in study area. This portrays, non-existence of relationship between off farm employment and above primary education in Jimma Arjo district, this would be because of most rural off farm activities do not need higher education level to involve in it.

Family size (HHSIZE); As economic theory predicts; family size is found to have positive and significant relation to diversification of livelihood strategies into local off farm activities at 1% probability level in study area. Accordingly, the marginal effect in the binary logistic regression shows that by holding other independent variables at their mean, an increase of family size from the mean value 6.58 to 7.58 would expect to increase probability of participating on off farm employment by 0.56 percentage point. The positive correlation between family size and off farm participation might be due to the relation between larger family size and corresponding higher demand for food in the household, which implies that while an additional member to the household increases, the probability of being participated in local off farm activity increase in order to meet basic needs to the family.The possible explanation from this result is large family size has relatively higher consumption needs, supporting the notion that participation in off-farm activities could be a strategy that enables household heads to increase the financial capacity to sustain family basic needs.This finding is similar to that of Seid Sani (2017).

Family labour: The presence of more adult family members is found to be significant at less than 10% probability level. It increases the likelihood of participation on off-farm employment. On average; as the number of adults in the family increase from 3.67 to 4.67, the likelihood of participation in off-farm employment increases by 0.62 percentage points. Having a greater labor

force, gives the household, the flexibility to distribute work between the farms and off farm employment, and therefore have a higher capacity of participation on off farm employment. However, the result is not inline with that of Adugna Lemi, (2009).

Size of farm land (FARMSIZE); The result of binary logit regression model shows that; the size of farm land was statistically and negatively significant at 1% probability level with off farm participation of rural farm households. The marginal effect shows that the respondents who have one-hectare greater land size than their neighbour counterparts have lower probability of participation in off-farm employment by 1.87 percentage points keeping other independent variables at their mean. Landholding influenced the choice as it was previously expected. This indicates that farm households tend to participate on off farm activities for push factor of small and fragmented farm land. On the other word as land size gets smaller, farm households should force to participate in off farm activities to generate additional income. That means, households with greater land size are less likely to engage in off farm employment as they may be busy with farm activities. This finding is similar to that of Bezabih et al, (2010).

Land fertility: Similarly, in addition to household's farm size; quality of that land is one of the variables expected to affect farm household participation on off farm employment. As it was hypothesized this variable is negatively and significantly influencing the choice of off farm employment at less than 10% significance level. Marginal effect indicates, keeping the influence of other variables constant, households owned richly fertile land are 1.82 percentage points less probability of participation on off farm employment than household holding poorly fertile land. This revealed us, since crop productivity depends on fertility of land, households owned poorly fertile land cannot got family basic needs from farm production, thus participating on off farm employment enables them to increase the financial capacity to sustain family basic needs.

livestock holding (TLU); unlike with prior expectation, livestock holding is positively influence household's choice of local off farm activities at 1% probability level. The marginal effect shows as the number of household's livestock unit increases from 6.88 to7.88, the chance to participate in off-farm employment increases by 0.49 percentage points, while other variables are kept at their mean value.This indicates, the farmer with higher livestock holding would have high

probability to diversify livelihoods into local off farm employment, since having more livestock will increase the possibility to get initial capital to start off farm self employment.

Access to Credit (CREDIT): As hypothesized this variable was positively and significantly influencing the choice of off farm employment at less than 5% probability level. Keeping the influence of other variables constant, the probability of credit user households engaging in off farm employment would be increase by 3.49 percentage points. This implies that households who use credit can more likely engage in off farm employment. On the other hand, households who do not use credit can less likely choose off farm employment. The possible reason would be credit enables the rural households to begin off farm self employment. Similarly, Engdayehu Zewdie and Sivakumar, S (2018) study identify that the more the households have access to credit the more the probability of participating in off farm activities

Households' saving (SAVING); Households' saving, also found to influence the off-farm participation of farmers positively and significantly at less than 5% probability level. It portrays, household who practiced saving are more likely to participate in off farm activities than those household who do not. Additionally, the marginal effect shows, saving practiced household's participation in off farm employment would increase by 3.69 percentage point holding another variables constant. This indicates that households who had the behavior of practicing saving would be more likely to engage in off farm employment than who do not practice it. This justify that, saving would enable the rural households to begin off farm self employment. This finding is consistent with study by (Norsida and Sami, 2009, Engdayehu Zewdie and Sivakumar, S, 2018).

Training (TRNING): It is found to have a negative and significant effect on households' participation decision in off-farm employment opportunities at 1% significance level. From the model result, marginal effect shows, holding other factors constant, the probability of participation decision in off-farm activities decrease by 7.18 percentage points as the farm household gets access to training. This could be due to almost all the training provided to the farmers were on means of enhancing agricultural production and productivity. This in turn aids farmers focus on agricultural production to obtain a higher income to meet their family

requirements through improving their agricultural production skills, knowledge, and experiences. The result of the study is consistent with findings of Yishak et al. (2014).

Distance (DISTNCE); It has a negative and significant impact on households' participation decision in off-farm employment opportunities at 1% significance level. From the model result, marginal effect shows us, by holding other independent variables at their mean, an increment of time spent to reach major market from the mean value 1.81 to 2.81 hours would expect to lower the probability of participating on off farm employment by 2.09 percentage points.

The possible justification is that markets serve as an important source of off-farm employment opportunities and information which promotes their participation decision. Those farmers living near the market center can easily access information and engage in off-farm to increase their income and improve their livelihood.

CHAPTER FIVE

Summary, Conclusion and Recommendations

5.1 Summary

Even though agriculture is the backbone of Ethiopia's economy, it will no longer provide sufficient employment for the growing rural labour force through time. Hence, the promotion of off-farm activities in addition to farm activities seems indispensable to alleviate rural poverty. This study contributes to the understanding of the rural off farm economic activity in Jimma Arjo district, Oromia regions of Ethiopia by addressing three research questions: i) What are the existing off farm activities pursued by rural households? ii) What are the existing off farm activities contribution in the study area? and iii) What determines an individual's choice of participation in off farm employment?

Data used for the study was collected from 288 households drawn from Jimma Arjo district. A multistage sampling method was used to select the households. In the first stage, the district was selected purposively. In the second stage based on the information of district office of Agriculture, 22 peasant associations/kebeles of district were stratified in to 3 agro ecology zone: lowland, medium land and highland. In the third stage one peasant association was randomly selected from each of the three agro ecology zone. In the last stage, based on simple random sampling method the respondents were selected from each identified peasant association for the study. In this study, descriptive statistics were computed, along with the econometric models, and arranged in a way that allows one to quickly comprehend their meanings.

According to the descriptive result, the proportions of youngsters in the off farm participants were more than non-participants. In addition most of households, who participated in off farm activities were headed by male and more than half of the sampled farmers participated in off farm employment were educated. In comparison, Participant farmers accesses credit, practiced saving, live close to market, and had a problem of land in terms of its size and quality than non-participants.

Econometric results also revealed that some demographic and socioeconomic as well as some institutional factors were determined the choice of farm households' participation on the off-farm employment. In addition, inadequate fund, lack of credit facilities and lack of necessary skills were totally constrained non-participant farmers from off farm participation. Finally, it is recommended to support enhancement of the infrastructures and institutions which help to develop willingness and ability of the small holder farmers' participation on off farm employment.

5.2. Conclusion

In this study, efforts were made to analyze the determinants of rural household's participation in off-farm employment. The possible number of variables were developed to identify and analyze those determinants. Additionally, types of off farm activities practiced in the study area, patterns of participation, both push and pull factors of participation as well as an importance of off-farm employment to the rural farmers were analyzed using simple descriptive statistics.

The results of this study show,69.45% of the sample households selected from the three kebeles of a district were participated in off-farm activities. Majority of participants,(84%) of them were pushed to engage in off-farm employment to meet their basic needs.The major off farm economic activities that help rural households in the study area comprises local trade, animal fattening, traditional handicraft activities, and selling of foods and drinks.Their participation had actually helped them to play important roles like relaxation of financial constraint,food security,better health,educating children and better housing. However,there were also households, who didn't participated on off farm employment due to different challenges like inadequate fund, lack of credit facilities, unavailability of off farm work, infrastructural problem and lack of necessary skills.

According to the descriptive results, there was a significant difference between off farm participant and non-participant households in terms of some demographic and socioeconomic characteristics of the farmers. The proportions of aged farmers in the non-participants were more than off farm participant farmers. More of an individual participated in off farm employment were literate in comparison to non-participant household heads. Moreover, the proportion of

male headed households, households with small size and poorly fertile of the land, credit accessed and saving practiced households, large family size households, more livestock holding households and households live close to market were more in participant households than non-participant households.

As mentioned earlier, logit model was also used to estimate the effects of hypothesized independent variables on the dependent variable. Out of fifteen explanatory variables hypothesized to determine farmers' participation, twelve were found to be statistically significant up to 10% probability level. Accordingly, the results of the binary logit analysis indicated that, six variables such as age of household head, family size, land size, total livestock unit, access to training and distance from major market were significant at less than 1% probability level. Four variables such as, sex of household head (male), household head education (informal and primary education), access to credit and saving practice were significant at less than 5% probability level. Additionally, family labour and fertility of land (rich) were found to be significant at less than 10% probability level to determine farmers' off farm participation.

Age of household head, land size, fertility of land, and access to training and distance from the major market were negatively and significantly influence farm households' participation on off farm activities. Sex of household head(male), education level of household head (informal and primary education), family size, family labour, total livestock, access to credit and saving had positive influence on off farm participation. Farm households were engaged in this employment mainly due to their participation had actually helped them to play important roles in uplifting their economic status and to achieve economic well being of their families.

5.3. Recommendations

The findings of this study have a wide range of recommendations to the improvement of the off-farm participation of the households in the country in general and Jimma Arjo district in particular. Understanding the determinants of off farm activities and the characteristics of the activities would help policy makers to design and implement more effective policies and programs for off-farm enterprises.

Based on the major finding of the study, the following points were recommended.

The off-farm sector plays important role in the supporting farm households to fulfill their family needs. So that, improvement of the participation of household needs the intervention of responsible bodies.

The positive and significant impact of sex of household head on the choice of off farm employment suggests that it is better the concerned bodies should organize program and meeting for female headed farmers to equally participate with men.

The findings of the study also revealed that educated farmers are more likely to involve in off-farm activities. Thus, education could be an effective instrument in increasing participation in off-farm activities. Therefore, giving special attention on encouraging the task of establishing skill training centers, which focused on off farm employment and upgrading the skills of farmers at local level is necessarily important.

The positive and significant impact of household size on the choice of off farm employment suggests that large family size household participate to meet basic needs; thus, it is better to give emphasis for creation of off farm employment opportunities for large family size households.

The negative and significant impact of land size on the farm household participation on off farm employment suggests that it is better a concerned body should design and plan of employment creation especially for the landless, poor land holding and less livestock owner of rural households.

Lack of access to sufficient fixed and working capital is a major constraint to boost off farm activities. As tried to mention in the findings, the respondents' access for credit service and practiced saving had higher probability of participation. Since financial capital is important to stimulate the rural off-farm economy and reduce the influence of people on natural resource base; it is better to work intensely on providing credit service for smallholder farmers and encouraging the practice of saving by farm households.

Poor access for market lowers off-farm employment participation. Thus, it is better to promote local markets (towns) by introducing infrastructure facilities like road, electricity, water and

others in order to create new self employment opportunities and make profitable for the already existed ones.

Overall results of this study show that ensuring the sustainability of education for farm household, providing credit service through easily accessible way, creating awareness and mobilizing saving, having more livestock and enhancing accessibility of market attract more farm households to off farm participation. Thus, it is essential to focus on improving access to off-farm opportunities by facilitating those tools in order to increase off farm participation of farm households. However, promotion of off-farm activities should be designed with special consideration of reducing the dependency of forest resources as a basis for off farm economic activities.

5.4 Suggestion for Future Research

Although there are notable contributions from this study, there are certain limitations. The study incorporated different demographic characteristics and socioeconomic factors that may affect farm household participation in off farm activities. However, there may be additional socioeconomic and demographic factors that can affect farm household participation in off farm activities. Again, this study was mainly limited to farm households' participation on off-farm employment in Jimma Arjo Woreda, among all other options of rural households' livelihood strategies. Therefore:

- Future research could incorporate time-series information at country level with larger sample size to better understanding of off-farm employment participation.
- It is also required to conduct study, that tries to see the off-farm work decisions of farm households in wage and self employment activities separately.
- The logit outcome of this study revealed that, out of fifteen explanatory variables incorporated in the model, three variables were insignificant (transport animals, non labour income and membership of cooperative society). Future researchers can also investigate why these variables were insignificant in the study area.

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Appendix 1: Tables representing descriptive and logit model

Table 1 Conversion factors to estimate Tropical Livestock Unit equivalents

Animal Category	TLU
Calf	0.25
Heifer	0.75
Sheep and goat	0.13
Cow and ox	1
Donkey	0.7
Horse	0.75
Mule	1.1
Chicken	0.013

Source: Storck, et al. (1991)

Table 2: Multicollinearity test for continuous explanatory variables

variable	**VIF**	**1/VIF**
AGE	124	0.794521
HHSIZ	1.38	0.725240
ADULT	1.34	0.743688
TLU	1.23	0.811238
FARMSIZ	1.06	0.939064
DISTNCE	1.06	0.943586

Table 3: Contingency coefficient for discrete variables

```
. spearman sex edu1 edu2 edu3  lanferty dfanima credit saving trning nlinco copscty
(obs=288)
```

	sex	edu1	edu2	edu3	lanferty	dfanima	credit	saving	trning	nlinco	copscty
sex	1.0000										
edu1	0.0891	1.0000									
edu2	-0.0451	-0.3514	1.0000								
edu3	0.0605	-0.1416	-0.1159	1.0000							
lanferty	-0.0861	-0.0587	0.0788	-0.0118	1.0000						
dfanima	0.0417	0.0072	-0.0057	0.0408	-0.2882	1.0000					
credit	0.1749	0.1718	-0.0648	-0.0652	-0.4746	0.3009	1.0000				
saving	0.0666	0.0119	-0.0161	-0.0216	-0.4352	0.2562	0.3401	1.0000			
trning	-0.2088	-0.0187	0.0632	0.0040	0.1145	0.0176	-0.2591	0.0274	1.0000		
nlinco	-0.0881	-0.0937	-0.0423	0.0231	0.3625	-0.2734	-0.3498	-0.3000	-0.0309	1.0000	
copscty	0.1015	0.0865	0.1809	-0.1177	-0.2577	0.2413	0.4283	0.1811	-0.1870	-0.3532	1.0000

Table 4 Binary logit model Estimation results

```
. logit hhcat age sex edu1 edu2 edu3 famsize adult landsize lanferty tlu dfanima credit saving trning distnce nlinco
>  copscty,robust

Iteration 0:   log pseudolikelihood = -177.26351
Iteration 1:   log pseudolikelihood =  -58.68412
Iteration 2:   log pseudolikelihood = -39.923855
Iteration 3:   log pseudolikelihood = -33.234018
Iteration 4:   log pseudolikelihood = -32.744827
Iteration 5:   log pseudolikelihood = -32.734743
Iteration 6:   log pseudolikelihood = -32.734734
Iteration 7:   log pseudolikelihood = -32.734734

Logistic regression                               Number of obs     =        288
                                                  Wald chi2(17)     =      88.87
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood = -32.734734                 Pseudo R2         =     0.8153
```

hhcat	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
age	-.1240808	.0355991	-3.49	0.000	-.1938537	-.0543079
sex	3.519915	1.493005	2.36	0.018	.5936781	6.446152
edu1	1.886161	.7213346	2.61	0.009	.4723707	3.29995
edu2	2.360665	1.105714	2.13	0.033	.1935065	4.527824
edu3	.7388081	.9944558	0.74	0.458	-1.210289	2.687906
famsize	.4589893	.1510789	3.04	0.002	.1628801	.7550986
adult	.5126189	.2997474	1.71	0.087	-.0748753	1.100113
landsize	-1.538259	.592964	-2.59	0.009	-2.700447	-.3760707
lanferty	-1.496279	.9744351	-1.54	0.125	-3.406137	.4135789
tlu	.4064227	.1144801	3.55	0.000	.1820458	.6307996
dfanima	.9200033	.6695176	1.37	0.169	-.392227	2.232234
credit	2.1153	.9252733	2.29	0.022	.3017979	3.928802
saving	2.28905	.8601551	2.66	0.008	.603177	3.974923
trning	-2.626839	.7939826	-3.31	0.001	-4.183016	-1.070661
distnce	-1.722141	.647098	-2.66	0.008	-2.99043	-.4538528
nlinco	-.1626712	.908881	-0.18	0.858	-1.944045	1.618703
copscty	.4313177	.7117094	0.61	0.544	-.9636071	1.826243
_cons	2.895779	4.42222	0.65	0.513	-5.771613	11.56317

```
. logit hhcat age sex edu1 edu2 edu3 famsize adult landsize lanferty tlu dfanima credit saving trning distnce nlinco copscty

Iteration 0:   log likelihood = -177.26351
Iteration 1:   log likelihood =  -58.68412
Iteration 2:   log likelihood = -39.923855
Iteration 3:   log likelihood = -33.234018
Iteration 4:   log likelihood = -32.744827
Iteration 5:   log likelihood = -32.734743
Iteration 6:   log likelihood = -32.734734
Iteration 7:   log likelihood = -32.734734

Logistic regression                             Number of obs     =        288
                                                LR chi2(17)       =     289.06
                                                Prob > chi2       =     0.0000
Log likelihood = -32.734734                     Pseudo R2         =     0.8153
```

hhcat	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
age	-.1240808	.0440115	-2.82	0.005	-.2103417	-.0378198
sex	3.519915	1.588359	2.22	0.027	.4067887	6.633041
edu1	1.886161	.9117823	2.07	0.039	.0991002	3.673221
edu2	2.360665	.9742351	2.42	0.015	.4511993	4.270131
edu3	.7388081	1.449095	0.51	0.610	-2.101366	3.578982
famsize	.4589893	.1673211	2.74	0.006	.1310461	.7869326
adult	.5126189	.3017962	1.70	0.089	-.0788907	1.104128
landsize	-1.538259	.4789841	-3.21	0.001	-2.47705	-.599467
lanferty	-1.496279	.8492327	-1.76	0.078	-3.160744	.1681867
tlu	.4064227	.112012	3.63	0.000	.1868832	.6259622
dfanima	.9200033	.8955606	1.03	0.304	-.8352633	2.67527
credit	2.1153	.8696001	2.43	0.015	.4109152	3.819685
saving	2.28905	.9602163	2.38	0.017	.4070606	4.171039
trning	-2.626839	.9909811	-2.65	0.008	-4.569126	-.6845514
distnce	-1.722141	.555327	-3.10	0.002	-2.810562	-.6337205
nlinco	-.1626712	.8695147	-0.19	0.852	-1.866889	1.541546
copscty	.4313177	.7985979	0.54	0.589	-1.133905	1.996541
_cons	2.895779	3.702392	0.78	0.434	-4.360777	10.15233

```
Note: 0 failures and 1 success completely determined.

. mfx

Marginal effects after logit
      y  = Pr(hhcat) (predict)
         =  .98770869
```

variable	dy/dx	Std. Err.	z	P>|z|	[95% C.I.]		X
age	-.0015064	.00128	-1.18	0.238	-.00401	.000997	47.0174
sex*	.248989	.28361	0.88	0.380	-.306883	.804861	.947917
edu1*	.018435	.0168	1.10	0.273	-.014502	.051372	.309028
edu2*	.0198458	.01718	1.16	0.248	-.013823	.053514	.25
edu3*	.0066779	.01114	0.60	0.549	-.015163	.028518	.0625
famsize	.0055722	.00477	1.17	0.242	-.003767	.014912	6.77083
adult	.0062233	.00645	0.96	0.335	-.006421	.018868	3.78125
landsize	-.0186748	.01524	-1.23	0.221	-.04855	.011201	1.50868
lanferty	-.0181652	.01456	-1.25	0.212	-.046695	.010364	1.29861
tlu	.0049341	.00396	1.25	0.213	-.002824	.012692	6.7982
dfanima*	.0107404	.01333	0.81	0.420	-.015381	.036862	.420139
credit*	.0348703	.02772	1.26	0.208	-.019466	.089207	.569444
saving*	.0368862	.0311	1.19	0.236	-.024078	.09785	.541667
trning*	-.0718375	.05286	-1.36	0.174	-.175447	.031772	.270833
distnce	-.0209072	.01491	-1.40	0.161	-.050128	.008314	1.81198
nlinco*	-.0020602	.01139	-0.18	0.856	-.024376	.020255	.239583
copscty*	.0055261	.01055	0.52	0.600	-.015142	.026194	.611111

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Appendix 2: Questionnaire

Jimma University

College of business and economics

Department of Economics

Interview Schedule for MSc Research Entitled Determinants of Farmers' Participation on off farm employment in case of Jimma Arjo Woreda, Oromia Region, Ethiopia

Instructions for enumerators/data collectors

- ✓ Make brief introduction to each household before starting the interview, get introduced to the farmers, (greet them in the local way) get his/ her name, tell them the purpose and objective of your study.
- ✓ Please, ask each question so clearly and patiently until the respondent understands.
- ✓ Please, fill up the interview schedule according to the farmer's reply (do not put your own opinion))
- ✓ Please, do not try to use technical terms while discussing with farmers and do not forget to use/record the local unit.
- ✓ During the process put the answers of each respondent both on the space provided and encircle the choice
- ✓ At the end prove that, all questions are asked & the interview schedule format is properly completed

Serial No ----------

Date ----------

Name of data collactor----------

Signature ----------

Section A. Identification and demographic characteristics of respondents

1. **Identification**

1.1 name of kebele with its agro-ecology: [] Hindhe (1) [] Jarso Kamisa Bera (2) [] Waayyuu sakaa (3)

1.2 household category: [] off farm participant (1) [] nonparticipant (0)

1.3 Type of off farm category of participant: [] wage employment (2) [] self employment (1)

2. Demographic characteristics of respondents

2.1 Gender of household head [] male (1) [] female (0)

2.2 Age of household head in year. [ ] _____

2.3 Current marital status of household head; [] single (0) [] married (1) [] widow/widower (2) [] divorced (4)

2.4 Education level of household head; [] illiterate (0) [] Informally literate (1)

[] primary (2) [] secondary and above (3)

3. Family characteristics of the respondents

3.1total family members of the household: _____

3. 2 Number of people whose age from 15 to 64 and not attending school in the household: ___

3.3 Number of members whose age below 15 or above 65 or still attending school in the household: ____

3.4. Is there a member of the household was unable to work in previous season due to health problems [] Yes (1) [] No (0)?

3.5. What do you suggest about level of your economy in relationship with your neighborhood?

[] Poor (1), [] Moderate (2), [] rich (3)

4. Households' asset variables

4.1. How big is your farm land? ___ ha

4.2. How do you perceive the average fertility level of your farmland?

[] Poor Fertility (0), [] Good/moderate Fertility (1)

4.3. Do you own livestock? _____1. Yes 2. No

If yes, indicate type and number of livestock owned currently.

Type of Livestock		Number
Cattle	Oxen	
	Cows	
	Heifer	

	Calves	
	Bull	
Sub total		
Sheep and goat	Sheep	
	Goat	
Equines	Hourses	
	Mules	
	Donkeys	
Poultry	Chicken	

4.5. Do you practice irrigation? [] No (0) [] Yes (1)

4.6. Do you save if you have any surplus? [] Yes (0) [] No (1)

4.7. If yes to question #6, how do you save? [] Cash at home=1, [] bank deposits=2, [] Equb=3, [] through livestock raising=4,

5. Infrastructures, social and institutional condition

5.1 Have you received training on livelihood strategy? [] No (0) [] yes (1)

5.2 What are the problems in access to market? [] Transportation problem (1) [] Too far from market place (2)

5.3 Do you listen to media (have radio/phone)? [] Yes (1) [] No (0)

5.4. Do you have clean water access to your family? [] No (0) [] YES (1)

5.5 Is there electricity access in your locality? [] No (0) [] YES (1)

5.6 Do you have transport access to the nearest town/city? [] Yes (1) [] No (0)

5.7 What is the time spent to arrive at the nearest town/city market? _____(hr).

5 .8Do you receive remittance? (No=0 Yes=1) …….

5.7 If yes to question number 5.6, who send you a remittance? [] My son/daughter=1, [] parents=2, [] other relatives=3, [] organization=4, [] If other please specify _____.

5.9 Do you belong to any cooperative society? [] No (0) [] Yes (1)

5.10 If yes in which Community Based Organizations you are a member? [] Iquib (1), [] idir (2), [] daboo (3) [] five peers led (4) [] kebele council (5) [] committee or local grouping (6)

5.11 Would you say you have relatives to rely on /ask for support in time of need?

[] No=0, [] Yes=1

5.12. Is there any credit institution in your locality? [] Yes (1). No (0)

5.13. Have you ever taken credit/loan for investment on any non-farm economic activities?

[] No (0) [] yes (1)

5.14. If yes, what is your source of credit? a. Savings and credit institutions

c. commercial/developmental banks b. Informal creditor's d. other_____

5.15. If your source of credit is formal sector, how much money did you borrow in the last two years? _____ETB

5.16. If you didn't borrow from formal credit institution, why?

1 High interest rate 2. Collateral requirement

3. Availability of other alternatives 4. I don't want 5. Other _____

Section B, off farm activity

1. Do you Practice off-farm activities? 1=Yes, 0=No., if your answer for above is yes; tell me the most important activities your family members have done in the last 12 months in terms of earning money or goods for themselves or for the household? Tick those appropriate for you.

ACTIVITY (IES**)**

Handicraft and weaving []

Local trading []

Selling firewood and charcoal []

Carpentry and forest products [ ]

Food- for-work [ ]

Animal drawn carts [ ]

Milling and tailoring [ ]

Sale of local food and drinks []

Hairdressing []

Shopkeeper []

Causal agricultural []

Religious worker []

Government organization [ ]

Daily wage work[ ]

Animal Fattening [ ]

work for trader (private sector) [ ]

Others please specify;

I._____

1.1. If you engaged in off-farm activities what was your most important motive for starting?

1. Limited farm income [], 2. To support livelihood []

3. Inadequate land to cultivate [] ,4. Large family size []

5. Seasonal nature of agricultural labor [] 6. Off-farm work is more rewarding than farm work []

7. The wage differential between the two sectors [] 8 the riskiness of each type of employment []

9. Availability of off-farm work opportunities [ ]8. Other, specify_____

1.2. If you participated in off farm employment, how do you undertake these activities?

1. Temporarily/casually [], why? _____

2. Seasonally or as par time activities []; reason out_____

3. Permanently []; why_____

1.3. List the main benefits you have got from off farm work.

_____

_____

1.4 If you don't engage in off-farm activities, what are the barriers to participate?

(1) Inadequate asset/capital [] (2) lack of credit facilities [ ]

(3) Lack of awareness and training [] (4) infrastructural problem []

(5) Cultural problems []

(6) Others (specify) I._____

II._____

1.5 In what ways do you think the above problems identified can be solved?

I._____

II._____

INTERVIEWS

1. What are the constraints for farm households to participate in off farm activities, in your peasant association/kebele?
2. What are the opportunities for diversifying the non farm activities in your kebele?
3. Do you think off farm activities are an essential component for the survival of farm households in the district?

4. What are the contributions of the existing off farm activities in study area for the rural people in particular and for economic development in general?

APPEENDICS 3: TRANSLATION TO AFAN OROMO

Maqaa ragaa funaanaa_____Mallattoo _____

Kan qulqulleesse _____ Mallattoo_____

Kutaa A: Gaafannoo Abbaa Warraatif

1.Haala maatii

1.1 ganda qonnaan bulaa haala qilleensaa gandichaa waliin [] Hindhee(baddaa) (1) [] Jarso Kamisa Bera (badda daree) (2) [] Waayyuu sakaa(gammoojjii) (3)

1.2 Haala maatii hojii qonnaan alaan walqabatee [] Ni hirmaatu (1) [] Hin hirmaatan (0)

1.3 Yoo ni hirmaatu ta'e gosa hojii qonnaan alaa kami?

[] Hojii dhuunfaa (1). [] qacaramee (2)

2. Odeeffannoo ragaa haala hoogganaa Maatiigaafatamtootaa

2.1 Saala hoogganaa/tuu maatii 1. Dhiira [] 0. Dubartii [].

2.2 Umurii hoogganaa maatii _____ (waggaa)

2.3 Haala gaa'elaa hoogganaa/tuu maatii: 0. Kan hin fuune/heerumne []

1. Kan gaa'ela qabu/du [] 2. Kan hiike/te [] 4. Kan irra du'e/jalaa duute []

2.4. sadarkaa barnootaa hooganaa maatii: 0. Kan hin baranne [] 1. Barnoota al-idilee [] 2. Barnoota sadarkaa 1ffaa [] 3. Barnoota sadarkaa 2ffaa fi isaa ol

3. Odeeffannoo ragaa haala Maatiigaafatamtootaa

3.1 Baay'ina miseensota maatii_____

3.2 Miseensota maatii umurii 15-64 jiranii fi kan barnootarra hin jirre_____

3.3 Miseensota maatii waggaa 15 gadii fi 64 olii akkasumas barnootarra kan jiran_____

3.4 Miseensota maatii keessaa sababii rakkoo fayyaa waqtii darbe kan hojii dadhabe jiraa?

1 eeyyee [] 0, lakki []

3.5 Sadarkaa dinagdee keetii olloota keen yeroo madaalamu kami?

0. Hiyyeessa [] 1. Giddu-galeessa [] 2. sooressa []

4. Odeeffannoo ragaa haala qabeenya lafaa fi horii maatii gaafatamtootaa

4.1 Lafa dhuunfaa keetii qabdaa? 1. Eeyyee 2. Lakki

4.2 Bal"inni lafa qabduu heektara meeqa ta"a? _____

4.3 gabbina lafa qonnaa kee ilaalchise: 1. Lafa furdaa 2. Diilolee/haphii

4.4 beeyilada qabdaa?0. lakki 1. Eeyyee

Yoo qabaatte, gosaa fi baay'ina beeyiladaa yeroo ammaa qabdu ibsi.

Gosa beeyiladaa		Baay'ina
horii	sangaa	
	Sa'a	
	goromsa	

	jabbii	
	dibicha	
Cita-waligalaa		
Hoolaa fi re'ee	hoolaa	
	Re'ee	
Horii geejibaa	farda	
	gaangee	
	harree	
indaanqoo	lukkuu	
Kan biroo		

4.5 jallisii hojjettee beeektaa? 0. Lakki 1. Eeyyee.

4.6 Yoo qarshii gahaa qabaatte qusattee beektaa? 0.lakki 1. Eeyyee

4.7Yoo qusattee beekte, akkamitti? 1. Manatti qarshii callaa [ ]2. Baankiitti []

3.Iqqubidhaan [] 4. horii bituudhaan []

5. **Odeeffannoo ragaa haala dhaabbata tajaajila hawasummaa fi kan biroo**

5.1 Leenjii ogummaa haala jireenya kee irratti fudhattee beektaa? 1. Eeyyee [] 2. Lakki []

5.2 Rakkooleen haala gabaatiin wal qabatan maaltu jira? 1. Rakkoo geejjibaa [] 2. lafaa gabaa irraa fagaachuu []

5.3 carraa miidiyaa hordofuu qabdaa? 1. Eeyyee [] 2. Lakki []

5.4 Tajaajila bishaan quluqulluu ni argattuu? 1. Eeyyee [] 2. Lakki []

5.5 Naannoo keessanitti tajaajila ibsaa/electricity/ ni argattu? 1. Eeyyee [] 2. Lakki []

5.6 Magaalaa isinitti dhiyoo deemuuf deemuuf tajaajila geejibaa ni argattuu? 1. Eeyyee 2. Lakki

5.7 Deebiin gaaffii '5.6" eeyyee yoo ta'e, gabaa mijataa isinitti dhiyaatu gahuuf saa'atii meeqa isinitti fudhata? _____

5.8 yeroo si barbaachisetti fira gargaarsa gaafattu qabdaa? 0. Lakki 1. Eeyyee

5.9 yoo qabaatte, eenyurraati? 1.intala koo 2. Ilma koo 3. fira kan biroo 4. dhaabbata gargaarsaa 5. Kan biroo (yaa ibsamu)

5.10 Miseensa gamtaa hawaasaa keessa jirtaa? 0. Lakki 1. Eeyyee

5.11 Deebiin kee eeyyee yoo ta'e, dhaabbata hawaasaa kamiif miseensa?1. iqqubii 2. Iddirii 3. daboo 4. tokko shanee hiriyummaa 5. kaawunsilii gandaa 6. Garee naannoo

5.12 Dhaabbbanni liqa kennu naannoo keessan jiraa? 0.lakki 1. Eeyyee

5.13 Hojii qonnaan alaa ittiin hojjechuuf liqa fudhatte beektaa? 0.lakki 1. Eeyyee

5.14 Deebiin kee eeyyee yoo ta’e maddi liqa kee maali? 1.Waajjira liqiif qusannoo 2. baankii 3. Liqeessitoota Al-idilee 4. Kan biroo yaa ibsamu

5.15 Yoo dhaabbata liqii idilee irraa liqeeffatte ta’e, waggoota darban lamman kana qarshii meeqa liqeeffatte? _____

5.16 Yoo hin liqeeffanne ta’e sababni maali? 1.dhalli liqii cimuu 2. Qabsiisa dhabuu 3. jiraachuu carraawwan biroo 4. waanan hin barbaadneef 5.kan biroo (yaa ibsamu) _____

B. hojiwwan qonnaan alaa

Hojiiwwan qonna cinatti ji’oottan 12n darban keessa miseensotni maatii kee galii irraa argachuuuf itti hirmaatan keessa kanneen murteessoo ta’an himi.

1. **Gosoota Hojiiwwanii**

1=Hojiiharkaa: [] sibiila tumuu, [] wayyaa dhahuu, [] wayyuu hodhuu/suphuu, [] rifeensa sirreessuu, [] firaashii hodhuu, [] hojii mukaa

2=Daldala; [] midhaan daldaluu, [] beeyilada daldaluu, [] dhugaatii fi nyaata nannoo gurguruu, [] suuqii

3=Horii furdisuu [] 4= hojii qonnaa nama biroof kaffaltii guyyaatiin []

5= hojii qonnaan alaa kaffaltii guyyaatiin [] 6=hojii qacarrii miindaa ji’aatiin [] 7= kan birooo, yaa ibsamu_____,

1.1. Yoo hojii qonnaan alaatti hirmaatteetta ta’e, akka itti hirmaattuuf maaltu si kakaasee ture?

1, xiqqeenya lafa qonnaa 2, dhabinsa lafa qonna 3, carraa gabaa 4, gorsa hiriyootaa

5, ittiin jiraachuuf 6, galiisaatiin qonna hojechuuf 7, ogummaasaa kan qonnaa caalaaa waanan qabuuf

8, kan biro

1.2.yoo hirmaatte ta’e akkaataa hirmaannaa keeti maali?

1. Yeroof/ akka tasaa: sababa ibsi

2. waqtiilee irratti hundaa’uuni; sababasaa ibsi

3.dhaabbataadhaani: sababasaa eeri

1.3 faayidaa hojii kanatti hirmaachuun argatte tarreessi.

1.4 hojii qonnaan alaa irratti yoo hin hirmaanne, maaltu si danqe?

1= hanqina kaappitaalaa 2=hanqina liqii 3=fedha dhabuu 4=rakkoo ilaalcha hawaasaa/aadefannaa

5=rakkoo bu'uraalee misoomaa6=kan biroo, yaa ibsamu

1.5 Rakkooleen armaan oliitti adda baafaman akkamitti furamuu danda'u?

_____

_____