WOLKITE UNIVERSITY

COLLEGE OF AGRICULTURE AND NATURAL RESOURCE

DEPARTMENT OF AGRICULTURAL ECONOMICS

SENIOR RESEARCH A PROJECT SUBMITTED TO: DEPARTMENT OF AGRICULTURAL ECONOMICS: IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR B.SC. DEGREE IN AGRICULTURAL ECONOMICS

DETERMINANTS OF HOUSEHOLDS PARTICIPATION IN NON-FARM ACTIVITIES IN CASE OF CASE CHEHA WOREDA, SOUTH NATION NATIONALITIES AND PEOPLES REGIONAL STATE,

PREPARED BY: **ID NO**

1, MULUGETA TESFAYE…....AGR/233/09

2, NIGIST BOGALE……..AGR/242/09

ADVISOR: Mrs. ZOMA K. (Msc)

MAY, 2019

WOLKITE, ETHIOPIA

ACKNOWLEDGEMENT

First of all, we would like to thank the Almighty God for His endless protection and adoration. Next to God a number of people have contributed to the completion of this thesis without which its completion would not have been possible. We were highly grateful to our Adviser Mrs. Zoma K. (Msc) for her valuable advice and guidance throughout the thesis work. We sincerely thank for her advice and guidance in all areas of this thesis, from reviewing the original proposal, checking and editing the survey questionnaires, and reading and commenting on the draft. Our family deserves special thanks for their patience, understanding, love and encouragement they gave us. We are very thankful to our parents for the encouragement and support they gave us moral. Thank you so much indeed. Last but not least, we would like to thank all of our close friends and classmates, who provide were encouraging and supporting us.

TABLE OF CONTENTS

LIST OF TABLE

LIST OF FIGURES

LIST OF TABLE IN THE APPENDIX

ABBREVIATIONS AND ACRONYMS

CSA	Central Statically Agency
GDP	Gross Domestic Product
HH	Household
ILO	International Labor Organization
NFA	Non-farm Activity
NFE	Non-Farm Employment
NGO	Non-Governmental Organization
NFSSD	National Food Security Strategy Document
NFS	Non-Farm System
RNFE	Rural Non-Farm Employment
RNFA	Rural Non-Farm Activity
RNFE	Rural Non-Farm Employment
RNF	Rural Non Farm
SNNPR	Southern Nation Nationality People Region
KM	Kilometer

ABSTRACT

In Ethiopia, over 20% of rural income originates from non-farm sources. This particular research was carried out with the aim of generating location specific data regarding the non-farm activities participation, determinants of non-farm income participation and factors to non-farm participation in Cheha woreda. The research employed both qualitative and quantitative research methods. The main aim of this paper is to describe the determinants of households' participation in non-farm activities in Cheha woreda, Southern Gurage zone. This paper analyzed the factors that affect household participation on nonfarm activities, types of nonfarm activities that households being participated or not participated in non-farming activity Cheha Woreda. The data collection process was done by conducting a direct interview and questioner with the respondents for the primary data were concerned with the case under the study. The respondents were selected on Gasory, yedebe and awana and chukara kebele of Cheha Woreda random sampling technique by considering our available resources such as; finance and time. The selected study design was a cross sectional design. The results of each study were discussed briefly on literature part. The final results were discussed and summarized using descriptive statistics such as (percentage, tables,) and Econometrics model like logistic regression analysis The binary logistic regression indicated that five variables such as sex of the respondent of household, nonfarm training, distance of from market, education of respondent of the household, and Age of respondent of house hold were had significant relation with dependent variables among the nine explanatory variables. The paper also contained recommendation part for the concerned bodies to create awareness about the problem and household participation of non-farm activity to reduce unemployment and increase income of one country its consequences and to make other further research paper on this issue in Cheha Woreda. The model result revealed that sex of household head, age of household head, educational status of household head, distance from the market and nonfarm training.

***Key words**, Binary logit model, nonfarm activity, household heads, Ethiopia*

1. INTRODUCTION

1.1. Background of the Study

There is increasing evidence that non-farm economic activities are important components of rural livelihoods in Africa, Asia and Latin America. Several studies show the dependence of rural people on non-farm economic activities and have highlighted the importance of these activities in sustaining rural livelihoods (Hazell and Haggblade, 1993; Lanjouw and Lanjouw, 1995; Reardon *et al.*, 2001; Barrett *et al.*, 2001; Lanjouw and Shariff, 2004; Davis, 2004). Rural household participation in non-farm economic activities reflects the reality of necessary economic diversification as a potential pathway out of rural poverty (Davis, 2001; Davis, 2006; World Bank, 2007).

The rural non-farm economy is generally defined as comprising all those non-agricultural activities, which generate income to rural households (including income in kind and remittances), either through waged work or in self-employment (Mishra, 2007). Thus, non-farm activities have become an important component of livelihood strategies among rural households by increasing the shares of non-farm income of the household which enables to insure against agricultural production risk. When farming is less profitable and more risky due to population growth and market failures, many households are pushed into non-farm activities (Ibekwe *et al*., 2010).
Consequently, the previous estimates vary substantially across countries with rural non-farm income generation activities shares across continents which range from 30 to 45% of rural income. For instance, in terms of rural employment opportunity of rural nonfarm activities involve about 25% in Asia, West Asia and North Africa, with higher figures in Latin America about 33.33 % and lower in Africa 10 % (Carletto, 2007).

According to Adams (2001) in developing countries between one third and half of the households generate their income from a non-farm source and the share of this type of income is between 20 and 70% of the total household income. As a result, policymakers pay attention to the importance of promoting rural non-farm employment opportunities in many developing countries. Agriculture alone can no longer absorb the rapidly growing rural population, and uncontrolled labor migration to urban areas, which often brings only higher social costs. Moreover, apart from employment opportunity and source of income, non-farming activity for most rural people in developing and transitional economies, rural non-farm activities are part of a diversified

livelihood portfolio. This ensured that rural population in developing countries derives important income shares from rural non-farm activities by minimizing agricultural risks (Barett, 2001).
Additionally, Ellis (2000) states that 30 to 50% of percent non-farm income share are common in Sub Saharan Africa countries and by giving an appreciably higher estimate for South Asia. Moreover, Davis (2003) found that the average non-farm income shares of rural households in some common wealth of independent states and central and Eastern Europe countries are between 30 and 70%.

In Africa, the average share of rural nonfarm incomes as a proportion of total rural incomes, at 42%, is higher than in Latin America 40% and higher still than in Asia 32% (Reardon *et al*., 2005). Most evidence shows that rural non-farming activity in Africa is fairly evenly divided across commerce, manufacturing and services, linked directly or indirectly to local agriculture or small towns, and is largely informal rather than formal (Reardon, 1997). According to Haggblade *et al*. (2008), services, commerce and restaurants to be the fastest growing non-farm sectors. Further, non-farm incomes provide the cash that enables a farm household to purchase food during a drought or after a harvest shortfall. Non-farm income is also a source of farm household savings, used for food purchase in difficult times.

In Ethiopia, over 20% of rural income originates from non-farm sources. In some parts of Ethiopia, non-farm income accounts up to 35% of total farm household income (Woldehanna 2000; Davis, 2003; Deininger *et al*., 2003). Besides, the modern business environments are changing ever more rapidly, making it increasingly difficult for small scale enterprises to compete the markets. So, it is time to envisage new ways to facilitate these enterprises and take advantage of their potential for broadening the base of development.
Hence, this study is conducted in Cheha woreda, which is located in the SNNPR state in gurage zone, most of the rural households doing non-farm activities(NFAs). Consequently, for the expansion of the rural non-farm(RNF) and diversification of income are desirable because it gives individuals and households more options to improve their livelihood and to improve their own living standards.

1.2. Statement of the Problem

Ethiopian peasant economies are characterized by heavy demographic pressure on small and fragmented farmland, and iniquitous land distribution structures; agriculture alone cannot solve the problems of rural unemployment and underemployment (Mishra, 2007). Nonetheless,

Ethiopia is a rural and agrarian society where nearly 85% of the population is directly dependent on agriculture for their livelihood. Because of the natural and socioeconomic problems, Ethiopian farmers are suffering from instability of income. RNFAs can play an important role in improving the well-being of the rural population (Beyene, 2008).

Beyond this, agricultural production fails to keep pace with population growth rate in the last 3 decades. As a result, quite a significant proportion of population lives in poverty. Although different studies showed various figures for poverty estimates, the National Food Security Strategy document(NFSSD) indicated an estimate of 45% of total population in 2007/2008 revealed that the incidence of food poverty is estimated at 52% in the rural area and 37% in the urban areas. This indicated that food insecurity was more severe in rural areas.

Despite the different measures taken by governments, the national economy still relies on the agricultural sector. This sector was characterized by low labor productivity, a declining farm size (an average of one hectare per household) and subsistence farming, soil degradation, inadequate and variable rainfall, tenure insecurity, weak agricultural research base and extension system, lack of financial services, imperfect agricultural markets and poor infrastructure (Degefe and Nega, 2011). The Ethiopian government has designed and implemented different interventions to improve agricultural productivity, such as irrigation schemes, fertilizer promotion, soil and water conservation, extension services, and food security policies, among others.

Nevertheless, focusing on agricultural production alone was not been enough to combat the population's vulnerability to shocks and the resulting food insecurity. Therefore, NFAs as sources of alternative income has paramount importance for people's livelihoods in the face of climate change, particularly in drought-prone areas and the degraded northern Ethiopian highlands (Devereux, 2012).Consequently, NFAs are important for alternative source of income generation, reduces agricultural risk in rural households, absorbs large amount of labor force and it would given chance for the flourishing of small, medium and large industries in the country. The efforts taken to support and due attention in Ethiopia for NFA is not yet good as of its paramount important (Beyene, 2008).

Siti and Roslan, 2010 and Ranjan (2006) pointed out several grounds on the desirability of developing the non-farm sector as a vehicle to reduce rural poverty. Among them are: (i) the growing rural communities cannot be sustained by the agricultural sector alone; (ii) rural economies are not purely agricultural and most of the rural communities derive their incomes

from various sources rather than from agriculture (iii) avoid rural-urban migration; (iv) reduce the rural-urban economic disparities; (v) reduce rural unemployment since rural industries are usually labor-intensive and hence, expected to absorb more labor; (vi) intensifies linkages between industry and agriculture, and thus support agricultural growth; (vii) reduce income inequality in the rural areas since the lower income group is expected to participate more intensely in nonfarm activities; and (viii) encourage the participation of women in the nonfarm sectors and hence empowering them.

The observed increase in the share of non-farm income in total agricultural household income as found in most studies has led to the argument that the NFS could play an important role in alleviating poverty (Siti and Roslan, 2010). Furthermore their result implies that if farmers are to diversify their income sources by participating in NFAs, their probability of being poor would be decreased.

Despite vast potential for NFAs in the Ethiopia, there are problems such as negative perception of the community, out-dated methods of production, lack of improved technology and skill, and lack of business start-up budget. There is also lack of pertinent research to study the role of non-farm activities on income generation and to identify the major problems that hamper the non-farm sector.

Furthermore, non-farm activities lack attention not only at national level but also at Kebele level. Cheha woreda was highly affected by natural hazards as well as man-made problems like drought, land degradation, famine etc. In such case, promoting non-farm activities is essential to reduce such recurrent problems but not yet. Thus, throughout this research the situations, the determinants and type of non-farm activities would be seriously described and analyzed, eventual relevant recommendation would be forwarded based on the findings to taken the problem of promoting non- farm activities.

In view of the above, therefore, the findings of this study could play an important role in filling the existing knowledge gap, providing information regarding the nature of rural non-farm employment and the determinants of farm household participation in non-farm activities in Cheha woreda. The findings could also be used in designing rural development interventions aimed at promoting attractive non-farm economic activities as effective pathways out of poverty, specifically for poor farm households.

1.3. Objectives of the Study

1.3.1 General objective

- The general objective of this study is to analyze the determinants of households' participation in non-farm activities in Cheha woreda.

1.3.2 Specific objectives

The specific objectives of this study are:

- ✓ To analyze factors that affect household participation on NFAs in Cheha woreda
- ✓ To identify types of NFAs that households are practicing in Cheha Woreda

1.4. Research Questions

- What are the factors that affect household participation on NFAs?
- What types of NFAs that households are practicing in Cheha Woreda?

1.5. Scope and Limitation of the Study

This study focused on analyzing the types of non-farm activities, the main determinants of households' participation in non-farm activities, and their contributions to generate income. The study collects cross-sectional data which were collected from three kebeles (gotes) of Cheha woreda. The finding and interpretations of the study are dependent on the sampled 94 households from the three kebele. Moreover, of the scope of the study limit to Cheha woreda. This is mainly because of limitation of availability of resources and time to undertake the study on a wider scale.

1.6. Significance of the Study

The result of this study was enabled us to known the main determinants of households' participation in non-farm activities in Cheha woreda. The study also identifies factors affected household participation on NFAs, which enables participants on which variables to focused to increase household participation on NFAs in Cheha woreda.

In addition, non-farming activities have great contribution for improvement of livelihood for rural poor households. Thus, non-farm activities were very essential to improve the income of the households. Moreover, an in depth study on the situations, the types and the determinants of non-farm activities pave a way to promote the rural non-farm economy in general and specifically in Cheha woreda. The study was creating awareness about determining factors of non-farm

activities participation and it was helped to give immediate solution to the problems. Furthermore study may benefits other researchers who have an interest on the related issues in the study area. Therefore, the findings of this study would play an important role in filling the existing knowledge gap, providing information regarding the nature of rural non-farm employment and the determinants of household's participation in non-farm activities in Cheha woreda. The findings would also be used in designing rural development interventions aimed at promoting attractive non-farm economic activities as effective pathways out of poverty, specifically for poor farm households. The major findings of this research were initiating other researchers to conduct further study on this and other related issues. In general the study comes up with its recommendation which identify the factors in order to reduce the negative influencing of non NFAs.

1.7. Organization of the paper

These study was composed of seven chapters the first chapter deals with introduction that contained background of study ,statement of the problem, objective of the study (general and specific objectives) significance of the study ,scope and limitation of the study ;second chapter express about review of related literature which decomposed in to the theoretical and empirical literature review; the third chapter consists of methodology that contained description of the study area, research design, sampling size and sampling techniques procedure, types and source of data, method of data collection, method of data analysis, hypothesis presentation, analysis, the fourth chapter results and discussion ,fifth chapter conclusion and recommendation sixth chapter reference, and the seventh chapter appendix.

2. LITERATURE REVIEW

2.1. Theoretical Literature

2.1.1. Definitions and concepts of non-Farm Activities

The most commonly used definition of "non-farm" and "off-farm" activity was the one forwarded by Reardon *et al*. (1998). According to them, the distinction lies on three-way classification on the basis of location, sector and function. "Farm" or "agricultural" refers to all activities in the agriculture sector, regardless of location or function. "Non-farm" or "nonagricultural" includes all activities outside the agricultural sector, regardless of location. "On-farm" or at-home includes all activities on one's own property, regardless of sectoral or functional classification; almost always self-employment. "Off-farm" or away-from-home refers to all activities away from one's own property, regardless of sectoral or functional classification; it could be wage or self-employment. There are two concepts related to the term "RNF". First, when we refer to "rural" income we mean income earned only in rural areas by rural households. Non-farm activities have become an important component of livelihood strategies among rural households. Different studies have reported an increasing share of non-farm income in total household income, (Haggblade *et al*: 2007 De Janvry and sadoulet, 2001, Ruben and Van de Bercy, 2001).

This was distinct from income earned anywhere (including urban areas) by rural households (Barrett *et al.,* 2001). Second, the sector "agriculture" should be defined to identify "non-farm" activities as any activities outside agriculture (own farming and wage employment in agriculture). Following Davis *et al.* (2004), and Haggblade *et al.,* (2007), agriculture, in addition to cropping, includes livestock husbandry, fishing and forestry. Although agro-processing was closely linked to agriculture (e.g. by transforming raw agricultural products) it was classified as non-farm. Jin and Deininger (2008) defined NFAs as all rural businesses that pursue market-oriented non primary productive activities, including transformation, transport and marketing of primary products, mining, manufacturing, commerce, transportation, and other services.

According to Misha (2007), defined non-farm activities as comprised all those non-agricultural activities which generate income to rural households (including income in-kind and remittances), either through waged work or in self-employment. Similarly, (Lanjouw, 2005) rural non-farm economy is defined as being all those income-generating activities (including income in-kind) that are not agricultural but are located in rural areas. NFAs such as metal work, petty trading,

pottery, masonry, carpenter and wood work. Thus, NFAs were those activities that are carried out by the household members not on their own land. Consequently, to mention some of those non-farm activities which were mentioned by different authors were like processing such as; preparation and selling of food, donkey carts and renting livestock for transportation purpose i.e. donkey and camel, domestic labor, daily engagement in labor work, petty trading, pottery, masonry and carpenter.

Lanjouw (2009) defines the rural non-farm economy as being all those activities associated with waged work or self-employment in income generating activities that were not agricultural but were located in rural areas. Thus, non-farm activities might include manufacturing (i.e. agro-processing) and be accumulative (e.g. setting-up a small business), adaptive, switching from cash crop cultivation to commodity trading (perhaps in response to drought), coping (e.g. non-agricultural wage labor or sale of household assets as an immediate response to a shock), or be a survival strategy as a response to livelihood shock.

2.1.2. The factors that affect household participation in non-farm

Though there was push and pull factors that lead rural poor to diversification there were also many challenges that were barriers to enter. These entry barriers tend to leave the poor with less diversified asset and income portfolios, thereby forced them to bear both lower expected returns and higher variability in earnings (Barrett *et al*., 2001). Even if there was a high potential to diversify the livelihood towards farm and NFAs in the west Bangwal India, there were problems such as negative perception of the community, outdated method of production, lack of improved technology and skills, lack of business start- up budget and absence of wide market for the nonfarm output a high (Biswarap and Ram, 2014). Lack of information and high competition were also serious constraints. It was assumed that since there were many people who were engaged in a given business activity, there would be high competition in the marketing of whatever was offered for sale ((Ibrahim and Onuk, 2008).

Hussein and Nelson, 1998 also list down the following constraints in the case of the developing countries among them unavailability of credit, lack of support for new income generating activities, exclusion of the poorest from membership of some organization (Burkinafaso), exclusion of certain groups (in particular, the poor or women) for the purposes of diversification, limited availability of education and skills training, primary activities not leaving enough time to pursue diversification strategies, degraded or insufficient natural resources (land, water...), no

urban centers in proximity, market access, government policies which extract surplus from people trying to diversify or which impede their preferred diversification strategies.

According to the study done in India finance to start up business and required skill was the main constraints (Biswarap and Ram, 2014). These two factors also take as the main barrier in the case of Ethiopia. Constrained access to credit and financial savings, where access was an increasing function of *ex ante* income and with regarded to educational level those the unskilled and uneducated depend disproportionately on more erratic, lower paying casual wage labor, especially in the farm sector the skilled where as educated are self-employed or can secure stable long-term employment at relatively high salaries (Barrett *et al*., 2001). High financial risk was as among major challenge in the study undertaken in Nigeria. The risk of investing a huge sum of money into a business has become a challenge and was a constraint to household members. This was because of the uncertain outcome from any given NFA (Ibrahim and Onuk. 2008).

There are also lacks of potential researches to study the effect of NFAs on farm production and to identify the major problems that hamper the nonfarm sector. State machinery should play a facilitator's role in terms of promoting investment in infrastructure such as road, electricity, irrigation facility etc. more of a decentralize operations for government programs, especially using the local institution for greater efficiency and better outreach is needed. Availability of support services such as credit to rural producers through appropriate changes in policies and delivery mechanisms should be ensured for sustainable development of farmers.

Over the last two decades, the nonfarm economy has increasingly become the central focus of attention in rural development policy, due to its positive contribution to poverty reduction and food security (Reardon and Ellis 1998; and Lanjouw and lanjouw 2001; Davis 2003). Participation in nonfarm activities was one of the livelihood strategies among poor rural households in many developing countries (Mduma and Wobst 2005).

Barrett, *et al.*, 2001 put down some challenges regarding policymakers face in the case of Africa when designing effective policy that help poor to participate in NFAs. These are;

1. Lack of some body that takes ownership with regard to research and extension. It was the loosen job between Government, NGOs and research institutions. So there is institutional gap between these three bodies
2. Their second challenges was stimulating rural financial institutions. Micro fiancé institutions make some progress in the past decade but remains uncertain, especially the

extent to which micro financial institutions allow populations previously unable to undertake higher-return NFAs access to sufficient working capital to permit productive nonfarm investment

3. Improved market access was the other challenge. It was beyond physical infrastructural fare of road building and maintenance, improved inter- and intra-regional communications, and rural electrification, but also institutional innovations to reduce entry costs through the introduction of grades and standards and public price reporting systems, and the relaxation of burdensome licensing and regulatory requirements on microenterprises

A large volume of recent empirical literature has been directed at analyzing the determinants of rural RNFE activities, especially in developing countries. These literatures indicate that diverse factors influence household's participation in non-farm employment activities. Moreover, the factors differ from country to country and according to the modeling approaches used. Some of such studies include Taylor and Yunez-naude (2001), Sanchez (2005) and Zahonogo (2011) who found education of the household head to be the most important determinant of decision to participate in RNFE activity in Mexico, Bolivia and Burkina Faso, respectively. The result of the logit regression analysis shows that the probability of working for wage was lowers for literate households than illiterate ones. The reason is that casual labor was generally perceived as a low status work by the public and more so by educated people.

Bayene (2008) found education of household to have no influence on the decision to participate in RNFE in Ethiopia. Instead age of the household head was the most influential variable. In general studies found gender, ownership of assets, and access to electricity and household size to positively influence decision to participate in RNFE activities (Beyene, 2008).

Ibrahim and Onuk (2008) Constraints to the development of small and micro enterprises can be categorized as: general infrastructure problem and firm-specific financial and economic problems. The infrastructure problem arises from the low quality and insufficient supplies of roads, electric power and telephone lines. In cottage handicrafts and small scale manufacturing enterprises, the major problem was lack of sufficient initial capital. The other problem was lack of adequate skills to start the enterprise for cottage manufacturing enterprises and lack of supply of raw materials and working premises.

Decisions by rural households concerning involvement in NFAs depend on two major factors: incentives offered and household capacity (Reardon *et al.*, 2001). Some poor rural households will make a positive choice to take advantage of opportunities in the rural nonfarm economy, taking into consideration the wage differential between the two sectors and the riskiness of each type of employment.

2.1.3. Characteristics of different types of non-farm activities

The rural NFAs could not be considered homogeneous; rather it was characterized by its heterogeneity, incorporating self-employment, micro and small-medium sized enterprises and traders.

According to Tassew (2000), a non-farm activity in which farm household participates was categorized into wage employment and self-employment activities. Three types of wage employment can be distinguished, namely paid development work, manual non-farm work, and non-manual (skilled) non-farm work. Paid development work involves jobs in community like, micro dam construction, community soil and water conservation works such as construction of terraces and a forestation, and other community work done under the food-for-work program. Manual non-farm work was an activity in which farm households work for private and public construction companies in urban and peri-urban areas. Non-manual (skilled) non-farm work involves masonry, carpentry and cementing in public and private construction sites. Non-farm self-employment comprises mainly petty trade, transporting by animals on their back, stone mining, pottery and handicrafts, selling of wood and charcoal, local brewery and selling of fruits.

Non-farm activities include all secondary and tertiary sector employment of both permanent and casual nature. Since these activities are quite diverse, a number of different terms are used in the literature to refer to non-farm employment. Broadly speaking, non-farm activities in the rural areas can be divided into the following categories (ILO, 2007): such as small-scale industrial activities are food processing (flour milling, oil processing, soap making and food processing), cottage industries (handicrafts, spinning of cotton or wool, cloth weaving and dying, pottery, leather tanning and distilling local), Artisan activities (blacksmiths, masonry, wood work/carpentry, house construction, repair services and fabrication of farm tools) and Commercial activities (trade and transportation).

2.2 Empirical Review

2.2.1 The Contribution of Non-Farming Activity for Income Generation

Non-farm activities have become an important component of livelihood strategies among rural households. Different studies have reported an increasing share of non-farm income in total household income, (Haggblade *et al.*, 2007 de Janvry and sadoulet, 2001, Ruben and van de Bercy, 2001). The reasons for this observed income diversification include declining farm incomes and desire to insure against agricultural production risk (Lanjouw, 2005). As studies in Africa during the 2007s, 2008s and 2009s shows that the share of income earned in the non-farm sector ranges from 22 to 93% of the total rural households incomes. The simple average share over the 25 case studies is 45 %. Small enterprise studies show similar figures (Collier and Lal, 2006; Collier *et al.*, 2001).

Estimate that 20-45 % of full-time employment of rural household was undertaken in small non-farm firm, and 30-50 % of rural incomes come from these activities. Rural non-farm income is also the backbone of the economy of numerous small towns scattered throughout the countryside as well as an important source of income and employment for many of the poor. Seen in this light, the rural non-farm economy will play an important role in determining the future prospects for employment growth and poverty alleviation in Africa (Hazel and Haggblade, 2004).

In addition, the combination of farm and non-farm work provides a hedge against fluctuation in the price of agricultural commodities related to variable rainfall and erratic world market (Swindell and Lliya, 2011). In some contexts, rural non-farm activities were also important sources of local economic growth like tourism, mining and timber processing). Often these shares were particularly high for the rural poor. There was evidence that these contributions are becoming increasingly significant for food security, poverty alleviation and farm sector competitiveness and productivity. According to De Janvry and Sadoulet (2001) studied the role of NFAs in rural households in Mexico. The result shows that participation in non-farm activities helps reduce poverty and contributed to greater equality in the distribution of income. Results of the Multinomial Estimation Method (where no participation in non-farm work was the choice comparison) show that education, ethnic origin and regional availability of non-farm employment are found to affected participation in off-farm activities. Empirical research has shown that nonfarm sources contribute 40–50 percent to average rural household incomes across the developing world (World Bank 2008a).

In Ethiopia, according to Davis (2003) and Deininger *et al.* (2003), some 20 percent of rural income originates from nonfarm sources. In some parts of Ethiopia, off-farm or nonfarm labor income accounts for up to 35 percent of total farm household income (Woldehanna 2000). The rural nonfarm sector plays a critical role in promoting growth and welfare by slowing rural-urban migration, providing alternative employment for those left out of agriculture, and improving household security thought NFA typically correlates positively with income and wealth (in the form of land and lavish diversification (Lanjouw 1999).

For example, Barrett *et al.* (2001) found thtock) in rural Africa, and thus appears to offer a pathway out of poverty if nonfarm opportunities can be seized by the rural poor. However, this key finding appears to be a double-edged sword. The positive wealth–nonfarm income correlation may also suggest that those who begin poor in land and capital face an uphill battle to overcome entry barriers and steep investment requirements to participation in nonfarm activities that are capable of lifting them from poverty (ibid.).Many factors are at play, and the particular activities that result are rarely attributable to a single factor. "Capacity variables" enabling households to undertake RNF activities, given the incentive levels, include capital assets such as human, social, financial, organizational, and physical capital. There are two strands in the literature on which one can drawn to conceptualize the role of capital as determinant of RNFA (Reardon *et al.,* 1998).

According to Gordon and Craig (2001) reported better education level increases probability of employment in regular salaried the opposite was often observed for employment in the casual non-agricultural wage sector. Involvement in self-employment was usually most likely for those with some basic education, but was lower for both the illiterate and those with high levels of education. Corral and Reardon (2001) and Hossain (2004) argue that better-educated members of rural populations have better access to any nonfarm employment, and were also more likely to establish their own nonfarm businesses. The household's endowment of work force also affected the diversity of household income sources, large-size households operating small farms as when population pressure on limited land was intense and/or access to operational holdings of productive land is not broadly based tend to engage in non-agricultural activities to supplement farm income (Balisacan, 1991).

3. METHODOLOGY

This chapter describes the methodological procedures employed in the study to answer the research questions. The chapter also provides a description of the procedures used for selecting sample households and variables included in the analysis. The description of methods and techniques used for data analysis and justification are also given.

3.1 Description of the study Area

The study would be conducted in cheha woreda. It was one of the14woreda on Gurage zone and known for its predominant cultivation. It located about 180 km away from Addis Abeba to south west direction. Cheha woreda is located 22km far from wolkite.It is bounded at north Abeshge woreda, at south Geta and Enmor woreda, at east Ezha and Gumer woreda, at west Yem woreda and Oromia region. The annual average rain fall is from 900-1500 mm belg rain fall from March to May, winter rain from June to September mid. The mean annual maximum and minimum temperature are 18^0_c and 30^0 respectively. Cheha woreda is 39 rural Kebele and 2 towns Kebele, total 41Kebele and estimate its total population of the area are male 67509 and female 70156, which total population are 137665(CSA, 2007). In the study area teff, coffee, maize, insets and chat are the major crop product produce by majority of the farmer. Cheha is greatly known by plantation of vocally puts tree and livestock which were the major component of farming system at this district the mainly rearing livestock were cattle, mules, donkey and hours are commonly reared by almost all farmer.

3.2 Research Design

The study adopted a cross sectional survey design and the nonfarm activities were the respondent in this study .the design enabled the collection of qualitative and quantitative data using questionnaires and interview ,data and aimed at answering the research questions was collected once and for all .the design was also used to compare study variables and establish the relationship.

3.3. Sampling Techniques and sample size

The study area was selected purposively because of the researchers are graduate students, short distance from a primary data source for the primary purpose of class attendance. Next we would be conducted in Cheha woreda randomly. In the first stage, Cheha woreda would be select purposively. In the second stage, three rural kebele select gasory, yedebe and awana and chukara

were select purposively due to different reason. These reasons are shortage of money, shortage of time, shortage of relevance transportation and lack of reference etc. Generally we could not contacted all people around that area, but we would take only sample of them because of above limitation. The total target populations from the three rural sub city were 1482. By considering the limitation of the time, budget and different constraints we select respondent randomly from gasore 561 form yedebe 469 and from Awan and chukara 452. Finally, 94 sample respondents would be selected randomly using probability proportional to sample size by applying Yemane's formula.

Yemane's sample size determination formula is expressed as;

$n = \frac{N}{1+N(e)^2} = \frac{\mathbf{1482}}{\mathbf{1+1482(0.1)^2}}$ **=94** households

Where: n is the number of sample size

N is the total population

e is levels of precision (error level) at 90% confidence level

Sample size from Gasory = $=\frac{94(561)}{1482}$=35

Sample size from yedebe=$\frac{94(469)}{1482}$/=30

Sample size from awana and chukara =$\frac{94(452)}{1482}$/=29

So, the total sample size of the respondents from the three Kebeles was 35+30+29=94

3.4. Source and Method of Data Collection

For efficient and successful achievement of the specified target for this study, data was collected from two main sources, primary and secondary sources. Primary data were obtained from sample respondents using face to face interview method of data collection to get first-hand information about non-farm activities and determining factors. Secondary data were collected from reviewing the relevant reference materials such as research documents, journals, and kebele office reports.

To collect data this study used the following main instruments namely; questionnaire, interview and organizational documents from quantitative data collection techniques and key informant interview from qualitative data collection techniques.

3.4. Methods of Data Analysis

This study used descriptive analysis, inferential analysis and econometric model to analyze the collected data.

3.4.1 Descriptive and inferential statistics

The researcher applied descriptive statistics to summarize and present the data in attractive and meaningful way. Percentages, frequencies, mean, minimum standard deviation, maximum, tables, graphs and charts were used.

To make inferences and predictions about the population based on the data from sample households; the study used inferential statistics like T- test and chi- squire test. T-test was used to test significance of continuous variables whereas; chi-squire test was used to test significance of categorical variables. All of these were computed using statistical tools like SPSS version 16 and STATA 11 version.

3.4.2 Econometrics Model

Logistic regression model was used to analyze the determinants of household's participation in non-farm activities. In this study, non-farm activities responses to the question whether a household participates in non-farm activities were "yes" or "no", a typical case of qualitative dichotomous variable. Gujarati (2004) pointed out that the most commonly used qualitative response models are the logit model, which corresponds to a logistic distribution function. A logit model was used to see the determinants of households' non-farm activity participation. Logit is a probability regression model, the application of which is recommended when the dependent variable is binary and assumes a value of 0 and 1. There are occasions where regressands or dependent variable can be qualitative or dummy, mostly in situation where the dependent variables are yes or no type. In practice many researchers choose the logit model because of its comparative and mathematical simplicity (Gujarati, 2004). This model was selected because of its suitability for the analysis of a dummy response variable.

The logit model was applied to estimate the decision of farmers' to participate or not to participate in non-farm activity participation; a binary choice model based on the method of maximum likelihood is specified. Each observation was treated as a single draw from a Bernoulli distribution (Greene 2000). The dependent variable was represented as 0 and 1 dummy, taking the value 0 for the farm household who do not participate in non-farm activity and 1 for participants. The predicted value of the dependent variable can be interpreted as the probability of participating in non-farm activity, given the values of the independent variables. These models

specify a functional relation between the probability of participating in nonfarm activities and various explanatory variables. The logit model can be expressed as;

$NFP = \ln(\frac{P}{1-P}) = \alpha+\beta_1x_1+\beta_2x_2+\beta_3x_3+\beta_4x_4+\beta_5x_5+\beta_6x_6+\beta_7x_7+\beta_8x_8+\beta 9x9 +\beta_{10}x_{10}+\beta_{11}x_{11} +\varepsilon_i$

Where:

NFP = Dependent variable, i.e. Nonfarm participation. 1 if engaged in nonfarm activity; 0 otherwise

B_0 = *constant;* β_1 *β2* β_3 β_4, β_5,, *β6,* β_7, β_8 β_9 β_{10} β_{11} = estimated parameters

ε_i= error term

ln=natural logarithm

P=probability of participating in non- farm activity

1-p=probability of not participate in non- farm activity

3.5. Hypothesis

3.5.1Dependent variable

Individual households in Cheha woreda were either participants or not participants in non-farm activities. So this study approached the dependent variable in "yes" or "no" responses which is a dummy variable. Therefore, households' participation in non-farm activity is the dependent variable for logit model.

3.5.2 Independent variables (explanatory variables)

Based on empirical studies, the following variables were taken as the determinants of non-farm activities participation of sampled households.

SEX: This dummy variable represents the gender segregation between male household heads and female ones. This variable takes the value of 1 for male household heads and 0 otherwise. The sign of this variable is hypothesized to be positive, which indicates that men are more likely to participate in non-farm activities. This reflects the fact that men have more time commitment to participate in the non-farm activities and have less time commitment to the household activities as compared to women (Amare Demissie and Belaineh Legesse, 2013).

Age of the household head: it is the number of years that the household spent after birth. This variable is a discrete variable and measured by the number of years. It is hypothesized that older farmers are expected to be less active and hence rely more on farm than non-farm activities.

Thus, the age of the household head is expected to have a negative coefficient. Several authors like (Abduselam Muse, 2011), (Amare Demissie and Belaineh Legesse, 2013), address the significance of household members' age in relation to their participation in the non-farm sector. It is a dimension of human capital and although it may not be amenable to change (except in the aggregate), it is important to understand how it affects participation in the non-farm sector. Smith (2000) notes that it is generally the younger household members who migrate in search of non-farm, income-earning opportunities, and point out that age is a factor synonymous with moving into the non-farm sector more broadly.

Marital status: This represents household head's status of being married. For this study, marital status will capture the effects of marriage on participation of non- farm activities. It is defined as a dummy variable that takes value 1 if household head is married and 0 otherwise. It is anticipated that the effect of being married on the decision to participate on non-farm activity is negative. Specifically, married household heads are associated with greater access to resources such as land as compared to those staying together, widowed, separated and those who were never married.

Educational status: was a dummy variable indicating if a household head is literate or not and it takes the value of 1 if the household is literate and 0 otherwise. It is hypothesized that illiterate household heads are expected to be less active and hence rely more on farm than non-farm activity. As a result, literate household head is expected to have a positive correlated with non-farm participation.

Reardon (2002) cites a number of authors who have addressed the importance of education and skills as determinants of business start-ups and wages earned non-farm in Africa. Better-educated members of rural populations have better access to any non-farm employment on offer, and are also more likely to establish their own non-farm businesses. Better educated individuals are more likely to migrate to take up employment opportunities in other areas, as they have greater chances of success than their less-educated or uneducated counterparts. This represents human capital endowment.

Credit access: It is hypothesized that less credit available expected to be less active on non-farm activities. Which is defined as the more credit available is expected to have a positive correlation with non-farm participation. It is dummy variable that takes the value 1 when the household takes loan and 0 otherwise. Islam (2007) cites the results of a four-country study in Africa (Bagachwa,

2009) where 30–84% of rural industries complained of poor access to credit – next in importance to lack of infrastructure inputs and markets. Land is often required as loan collateral and this can exacerbate income inequality associated with rural non-farming activity. Reasons for market failure in credit include: the lender does not know the default risk of each potential borrower and to collect this information is costly; moreover, there is an associated moral hazard problem that rural credit programmers may attract borrowers with no intention to repay.

Nonfarm Training: This is a dummy variable representing whether any member of the farm household has undertaken any training in nonfarm activities. Nonfarm training is increasing of household skill and awareness about non-farm activities. Nonfarm training is expected to have positive correlation with non -farm participation. It is Dummy variable that takes the value 1 when the household takes nonfarm training and 0 otherwise. sosina etal(2012).

Distance of homestead from the market: Physical access to market improves non-farm earnings opportunities. Therefore, longer distance to the nearest market is expected to negatively influence diversification due to high transaction and transport costs as well as lack of market information. Therefore, longer distance to the nearest farm is expected to negatively influence diversification due to high transaction and transport costs as well as lack of market around it Mikael Irma (2009).

Household size: This refers to the number of individuals living in a household. Having more people living in a household indicates a greater burden on the actively working individuals. So that, it is hypothesized that less family size are expected to be less active and hence rely more on farm than non-farm income. This is defined as the larger families, is expected to have a positive correlated with non-farm participation. The structure of rural families plays a significant part in determining access by individuals to non-farm opportunities. Reardon (2009) observes that family size and structure affect the ability of a household to supply labor to the non-farm sector. Larger families and those with multiple conjugal units supply more labor to the rural non-farming sector, as sufficient family members remain in the home or on the farm to meet labor needs for subsistence. Smith (2007) applies the same logic to migration opportunities, observing that extended family structure influences access to migration. In this case, the longer absences involved make it all the more important that those remaining in the home are able to supply the basic labor required for subsistence.

Number of livestock owned: Defined as the number of livestock a household has. It is expected to have negative coloration with the non-farm participation. Since households who have more livestock participate more on agricultural activities than non-farm activities.

Table 1 Definitions of variables

Variables	Definition	Measurement	Expected sign
NFP	Nonfarm participation	Participation	
AGEHH	Age of the household	Number of years	_
SEXHH	Sex of the household	0 for female 1,for male	+
EDUSHH	Educational status of the household	illiterate 0 and Literate 1	+
MARSHH	Marital status of the household	0 for unmarried 1 for married	+
TFMSIZE	Total family size	Number of individuals	+
CREDACCES	Credit access	0 for no and 1 for yes	+
NONFATRAIN	Nonfarm training	0 for no and 1 for yes	+
DISMKT	Distance from market	Km	_
NOLIVESTOCK	Number of livestock	Number	_

Source: own survey, 2019

4. RESULT AND DISCUSSION

In this chapter the results of determinants of nonfarm activities are presented by using descriptive statistics, inferential statistics and econometrics model (binary logistic regression).

4.1 Participation on Nonfarm Activities in Cheha woreda

Respondents were interviewed to regarding to the participation of households in nonfarm activity. The survey result showed that 52(55.32%) of respondents were participating in nonfarm activities; whereas, 42(44.68%) of the respondents were not participating in nonfarm activities and their employment was mainly from farming and other sources like off farm activities. This figure shows that participation in nonfarm activities in the study area is smaller when compared to some figures such as the country average 57.3% of the rural household participate in nonfarm activities (Amare Demissie and Belaineh Legesse, 2013).

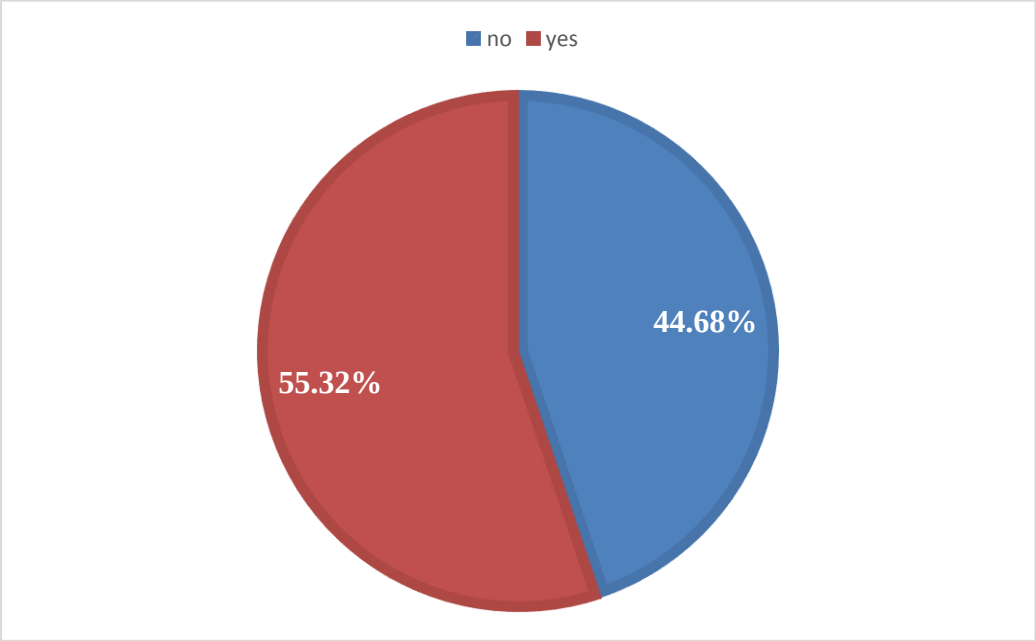

Figure 1 Participation of households in nonfarm activity

The survey result revealed that the major nonfarm activities in Cheha woreda with their the share of each nonfarm activity is 5.32% of petty trade, 11.70% of hiring out labour, 6.38% of Firewood 3.19% of Renting out animal drawn cart, 6.38%ofGrain trading, 4.25%ofHouse rent income, 2.13% of Remittance income, 3.19% of Sale of handicraft , 12.76% of Sale of beverages, 4.25% of Livestock trading, 8.51% of Weaving, 2.13% of Tannery, 5.32% of Carpentry, 1.06%

of Black smith, 10.64% of Daily labor, 1.06% of Pottery, 11.70% of other non farming activity like driver, guard, chat trading etc from the total frequency of nonfarm activities.

Table 2 Types of nonfarm activities in Cheha woreda

Non farming activity	Frequency	Percent
Petty trade	5	5.32
Hiring out labor	11	11.70
Firewood collection	6	6.38
Renting out animal drawn cart	3	3.19
Grain trading	6	6.38
House rent income	4	4.25
Remittance income	2	2.13
Sale of handicraft	3	3.19
Sale of beverages	12	12.76
Livestock trading	4	4.25
Weaving	8	8.51
Tannery	2	2.13
Carpentry	5	5.32
Black smith	1	1.06
Daily labor	10	10.64
Pottery	1	1.06
Others	11	11.70

Source: own survey result 2019

4.2. Income shares of different income sources

With regard to income share of nonfarm activities with the total income of household, it counts about 30.40% as it shown from the Table 4 below. The income share of nonfarm activity is smaller when compared to some research results in the country and other developing countries such as the rural nonfarm economy (RNFE) have grown to account for 35 to 50 percent of rural incomes across the developing world (Tommy, 2012).

Table 3 Income shares of different income sources

Income Source	Average annual Income	Share of income in percentage
On farm	25122.86	67.08
Nonfarm	11387.75	30.40
Off farm	943.14	2.52
Total	37453.75	100

Source: own Survey, May, 2019

Just like other areas of Ethiopia and other developing nations the highest share of income in the study area is driven from farming. It accounted 67.08% of the total income earned by the households as it is shown from the above Table 4. It means the livelihood of the people in the area is mainly depends on agriculture. Many of the people took agriculture as a sole means of income generating activity. Beyond farm and nonfarm means of generating income off-farm income generating activities are the third means of generating income in Cheha woreda. Its contribution counted 2.52% from the total HH income. Working on others farm as a casual laborer or in the form share cropping (locally called Kencha) and making charcoal are among those off farm practices in the study area.

Table 4 Roles of nonfarm activities for income generation

Name of nonfarm activity	Total income generated by this activity	Share of income By the activity from the total (%)
Petty trade	415550	10.43
Hiring out labor	435700	10.93
Firewood collection	214700	5.40
Renting out animal drawn cart	397000	9.96
Grain trading	156400	3.92
House rent income	169100	4.24
Remittance income	11500	0.30

Sale of handicraft	105501	2.65
Sale of beverages	265060	6.65
Livestock trading	108000	2.70
Weaving	40000	1.00
Tannery	47500	1.20
Carpentry	184000	4.60
Black smith	10000	0.25
Daily labor	1015100	25.45
Pottery	8900	0.22
Other activities	401700	10.10
Total	3985711	100

Source; own survey, 2019

As we see from the above table, daily labour is the first in terms of income generation with a share of 25.45% of the total nonfarm income. The Second one in the study area among nonfarm activities that people mostly engaged in is hiring out of labour with nonfarm income share of 10.93%. People in the study area are engaged in Mining of stone and sand which is used for construction purpose. The third highest share of non farm income goes to petty trade, which covers about 10.43% of the total nonfarm income share. Females in the study area mainly engaged in petty trade and alcohol (Tella and Arekie) trade. Preparing and selling of Food also done in the area laterally with Alcohol marketing. These activities are done usually by those unmarried women.

4.3. Descriptive Statistics

The survey collected a wide range of information which is essential to the interpretation of the findings and understanding of the results of the study on determinants of nonfarm activities. The background characteristics of respondents interviewed in the study area such as Sex, Age, marital status, Educational status, Credit access, Land size, nonfarm training, Distance from market, household size, Number of livestock owned, dependency ratio and income from other sources are presented in this section using figures and tables.

4.3.1. Descriptive statistics for cateSgorical variables

This section explains categorical variables like sex of the respondent, marital status of the respondent, credit access, educational status, nonfarm training and their relationship with participation of households' in nonfarm activities.

Sex of the household: As the survey indicated 82(87.24%) of the respondents were male household heads; whereas, the remaining12 (12.76%) of the respondents were female household heads. Among the male household heads, 70 (74.47%) and 12(12.77%) were participants and non participants in nonfarm activity, while, 9(9.57%) and 3(3.19%) of female headed households were participants and non participants in nonfarm activity, respectively. The result revealed that the participation of female headed households are less than the participation of males in nonfarm activities. This may be due to the influence of the head and cultural factors that females are naturally assigned to household activities (Amare Demissie and Belaineh Legesse, 2013). This implies that females carry high burden and work load in home as a house wife in addition to helping males in agriculture. Female households spent most of their time at home. But as males carry high responsibility of feeding their household member, they are forced to participate in alternative income sources in addition to agriculture. The result of Chi-square test indicated that sex of the household head and non-farm income participation had statistically significant association at less than 1% significance level (Table 6).

Educational status of the household: Educational status was also one categorical variable which affect the level of participation of households in nonfarm activities. Education and skill are critical factors making line in distinguishing the livelihood strategy option of the poor and the rural better off (Ellis, 2000). The researcher divides sample households in the study area based on their educational status as, '' those who can read and write as literate and those who can't read and write as illiterate.''

The result of this study shows that 78(82.98%) of the respondents can read and write, whereas 16 (17.02%) of the sampled respondents were still unable to read and write. Many of the respondents who can read and write are due to the campaign done in the former regime called "Meserete Timherit" and currently some are participate in adult education. From those who can read and write, 68(72.34%) of these households were participating in nonfarm activities whereas, 10(10.64%) of those who can read and write were not participating in nonfarm activity. among those who can't read and write only 11(11.70%) of these households were participating in nonfarm activities and the remaining 5(5.32%) of those who can't read and write were non

participants in nonfarm activities. As the survey shows, households who can read and write (literates) participates more in nonfarm activities as compared to those households who can't read and write. This is happened because, for those who can read and write participating in other alternative sources of income generating activity (nonfarm) will be easy since they can consider different situations easily. For example those who can read and write engage more in trading different things than those who can't read and write. In addition as a household is literate he or she will have better chance to be employed in alternative activities. The Pearson Chi-Squared statistic, $\chi 2$ =23.20, degrees of freedom 1, corresponding to $p < 0.01$.

Participation in nonfarm activities and educational status

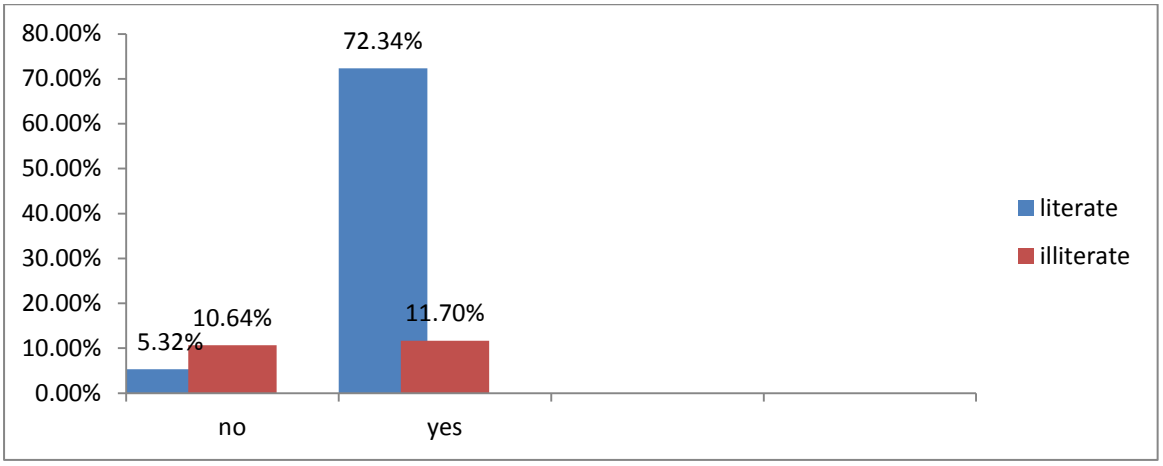

Figure 2. Educational status of households and participation in nonfarm activity

Table 5 Descriptive and inferential statistics for categorical variables

Variables	Categories	Participation in nonfarm						X^2 value
		Participant		Not participant		Total sample households (94)		
		Number	%	Number	%	Number	%	
Sex of HH	Male	70	74.47	12	12.77	82	87.24	
	Female	9	9.57	3	3.19	12	12.76	37.12***
Educational status	Literate	68	72.34	10	10.64	78	82.98	23.20***
	Illiterate	11	11.70	5	5.32	16	17.02	
Credit access	Have access	8	8.51	6	6.38	14	14.89	

	Don't have access	71	75.53	9	9.57	80	85.11	30.65***
Nonfarm training	Take training	64	68.09	1	1.06	65	69.12	44.96***
	Don't take training	15	15.96	14	14.89	29	30.85	
Marital status	single	24	25.53	3	3.19	27	28.72	14.37***
	Married	46	48.94	11	11.70	57	60.64	
	divorced	5	5.32	1	1.06	6	6.38	
	windowed	4	4.26	0	0	4	4.26	

Source: own survey, *** **-indicates significance level at p<0.01(1%)**

Credit access: Credit plays a vital role to improve the livelihood of rural households. According to the survey, from the total sample households, 14(14.89%) of households had credit access, whereas 80(85.11%) of the total sample households don't have access to credit. From those sample households who are participating in nonfarm activities, 8(8.51%) of households had access of credit, and only 71(75.53%) of the households don't have access of credit. The study also presents that from those sample households who are not participating in nonfarm activities, only 6(6.38%) of households have credit access and 9(9.57%) of households haven't credit access. As households have access of credit, it will be easy to start nonfarm activity to support the ongoing agricultural activity. Access of credit solves a problem of shortage of startup capital to start a new business activity (nonfarm activity) and shortage of working capital to continue the started non-farm activity. This is why households with credit access are participating more in nonfarm activities than those without credit access in the study area. Moreover, the result of chi-square test revealed positive and a highly significant relationship of credit access with nonfarm participation ($X^2 = 30.65$, p =0.000) at 1% of significance level.

Training: Nonfarm Training increases the awareness and knowledge about the importance of participating in nonfarm activities and alternative income sources. From the total sample households in the study area, 65(69.12%) of households took nonfarm training, whereas 29(30.85%) of households didn't get nonfarm training. in addition to this 64(68.09%) households took nonfarm training and are participating in nonfarm activities and 1(1.06%) of households took nonfarm training but are not participating in nonfarm activities. the study also presents that, households who don't take credit but are participating in nonfarm activities are 15(15.96%)

while, 14(14.89%) of households don't have credit access and are not participating in nonfarm activities. As explained here, households who took nonfarm training were more participants in nonfarm activities than households who didn't took nonfarm training. This is because, as households take nonfarm training, their awareness towards the benefit of nonfarm activities be improved and they develop the tendency of participating in alternative income sources. The chi-square test result also indicates that there is a highly significant association between nonfarm training and participation in nonfarm activities at 1% level of significance ($X^2 = 44.96$, p =0.000).

Nonfarm participation and nonfarm training and their relation

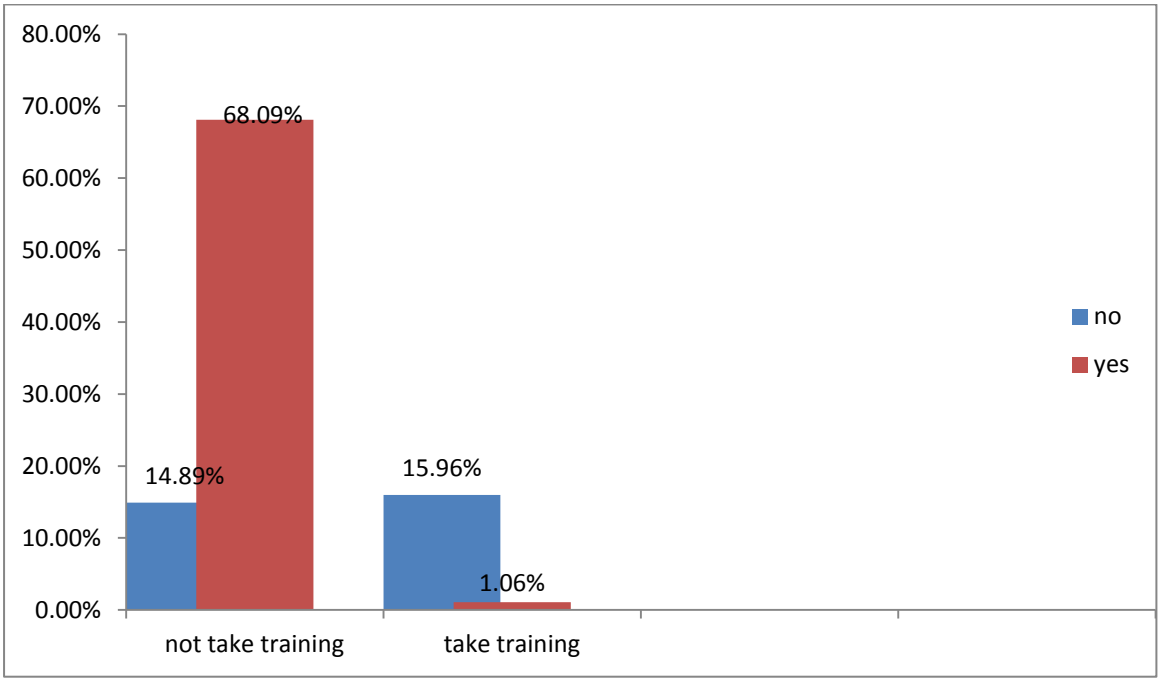

Figure 2 Nonfarm training and nonfarm participation

Marital status of households: From the total sample households 57(60.64%) and 27(28.72%) of households were married and unmarried respectively. Among the respondents 46(48.94%) households were married and nonfarm participants whereas, 11(11.70%) households were married and non participants in nonfarm activities. The remaining 24(25.53%) and 57(60.64%) of households were unmarried and participants and unmarried and non participants respectively. As the study, shows married households are participating more in nonfarm activities than unmarried households in the study area. As households get married, they are shifting from helping themselves towards helping the whole family. The amount of burden and responsibility is increased as a household get married. This challenge of responsibility and burden push the household for searching other alternative sources of income. The chi-square test also shows that

there is a highly significant association between being married and participation in nonfarm activity at 1% level of significance. This implies that nonfarm participation is dependent on marital status of households (nonfarm participation is not independent on marital status of households rather it is dependent).

4.3.2. Descriptive statistics for continuous variables

Under this section the result and discussion of continuous variables like, age of household head, land size, distance from the market, household size, dependency ratio and number of livestock and their association with nonfarm participation explained briefly.

Table 6 Descriptive and inferential statistics for continuous variables

Variables	Non participants		Participants		Total sample (94)		
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Stand Deviation	T-value
Age of the house hold head	51.64	14.99	42.84	11.64	46.79	13.94	6.0237***
Distance from market(Km)	3.51	1.11	1.25	0.98	2.26	1.53	19.8993***
Total family size	4.93	2.05	7.26	1.79	6.22	2.23	-11.2081***
Number of Livestock	7.78	3.65	5.05	2.96	6.27	3.55	7.5499***

Source: own survey, *** -indicates significance level at 1%

Age of the household head*:* The mean age of the sample household heads were 46.79 years with standard deviation of 11.94. The minimum age of the household head was 23whereas the maximum ages were 78 years. Besides, the mean age of households participating in nonfarm activity was 42.84years and the mean age of non participant households in nonfarm activities was 51.64 years with standard deviations of 11.64 and 14.99, respectively. According to the survey result, households participating in nonfarm activity are younger age than that of non participant households in nonfarm activities. The maximum and the minimum age of households

participating in nonfarm activity were 78 and 23 years respectively. Additionally, the maximum and the minimum age of non participant households were 78 and 26 years respectively. Younger households have relatively better awareness about different alternatives and benefits of participating in different wings of activities. They have enough labor and interest than older households and they have high interest to participate in nonfarm activities. The independent T-test indicates that the mean age difference between participant and non participant households was significant at $p<0.01$. This result shows younger households are participating more in nonfarm activities as compared to the older households. Younger household heads derived more wage employment income compared to their older fellow farmers Amare Demissie and Belaineh Legesse,(2013), whereas when a person gets older, the probability of participating in nonfarm activities decreases (Abduselam Muse, 2011*).*

Family size

Family size indicates that the number of individuals in the family. According to the survey the mean family size of the total observation was 6.22 with standard deviation of 2.23. The minimum and maximum size of household in the study area was 1 and 11 respectively. The study also presented that, the average family size of the sample households participating in nonfarm was 7.26 with standard deviations of 1.79. The average family size of non participant households was 4.93 with standard deviation of 2.05. The result of T-test indicated that there is statistically significant mean difference due to family size of the respondent. This indicates that households with large family are tends to participate more in nonfarm activities than small size families at $p<0.01$.

This result tells us, as the size of the family size increases, there will be more burdens on the shoulder of the household head to feed the family. This more burden and increasing household consumption leads the household to find other channels of income generation to meet his and his families need.

Distance from the market in (km

Distance from the market was considered as one factor which affects the participation level of households in nonfarm activities. The survey indicates that the average distance of the households from the market was 2.26km, with standard deviation of 1.53km. The average distance of households from the market was 1.25km for those who participate in nonfarm activity, with standard deviation of 0.98km. In addition to this the average distance of households from the market was 3.51km for who are not participating in nonfarm activity, with standard deviation of 1.11km. The independent T-test also indicated that there is significance mean difference between participants and non participants of nonfarm activities due to distance from the market.

Livestock ownership

The livestock ownership is an indicator of household's wealth and social status in rural household's community. Besides, it is the main source of food, income, draft power, live asset, social security and means of livelihood diversification (cropping mechanism during drought and hardship seasons) for rural households. As the survey revealed the average number of livestock that the whole respondents own were 6.27 livestock with standard deviation of 3.55 livestock. The maximum and the minimum number of livestock that the total observation owns was 20 and 1 livestock respectively. The survey also indicates that the mean number of livestock owned by participant and non participant households was 5.05 and 7.78 livestock, with standard deviation of 2.96 and 3.65 livestock respectively. As households hold large number of livestock they tend to focus on agriculture than participating in nonfarm activity.

4.4. Determinants of participation in nonfarm income generating Activities

According to De Janvry and Sadoulet (2005) studied the role of non-farm activities in rural households in Mexico. The result shows that participation in non-farm activities helps reduce poverty and contributes to greater equality in gained of income. Results of the Multinomial Estimation Method (where no participation in non-farm work is the choice comparison) show that education, Credit, Land size, Family number ,Distance from the farm, number of oxen, use of agricultural inputs ,sex, age and regional availability of non-farm employment are found to affect participation in off-farm activities. Education helps the farm households in the study area to participate in the more remunerative off-farm activities. A study also shows that the effect of Human capital variables such as education, family size & age are expected to increase the labor, the experience, know-how and the skills important to engage non farming activists and expected

to they have positive effect on nonfarm activities. Similarly, land size and access to credits have an effect on the participation employment. But among these ages can have both negative and positive effects on nonfarm activities. This because as the head or an active member of the household gets older, he/she is likely to be less active. Thus, having more active household members with in the economically productive age group (between 15 &64) likely to 12 increase a household's participation in to non-farm income generating activities. There are various factors which affect participation decision of households in nonfarm activity. The main factors are studied weather they are determining or not in nonfarm participation by the binary logit model.

The binary logit model was used to see household‘s participation in nonfarm activities and the various independent variables which determine the household‘s participation decision to nonfarm activity. In this study the dependent variable is participating or not-participating in nonfarm activity. Participation in nonfarm activity is defined in this study as the participation of households in any non-agricultural activity apart from crop production and livestock rearing. Such activity may include activities such as participating in daily labor, petty trade, hiring out labor, Trading, fire wood collection, livestock trading carpentry and other nonagricultural wage employments and others which are undertaken by households as their secondary job besides their primary activity of agriculture. The results of binary logit model shows that, from the 9 explanatory variables that are included in the model, 5 variables had significant effect on household‘s nonfarm activity participation.

Table 7 Result of binary logit model

Logit regression estimation				Marginal effect estimation		
NFP	Coef.	Std. Err.	P>z	dy/dx	Std. Err.	P>z
SEXHH	3.413915	1.690094	0.043**	.0196464	.03458	0.570
AGEHH	-.1315013	.0549336	0.017**	-.0001386	.00028	0.623
EDUSHH	4.770797	2.490626	0.055*	.0519564	.05946	0.382
MARSHH	2.596981	1.952561	0.184	.0027366	.00559	0.624
TFMSIZE	.3297729	.2878673	0.252	.0003475	.00072	0.628

CREDACCES	3.198054	2.00682	0.111	.0151492	.02652	0.568
NONFATRAIN	6.21926	2.179672	0.004***	.0720892	.08186	0.379
DISMKT	1.040031	.5638334	0.065*	.001096	.0022	0.619
NOLIVESTOCK	.4737592	.4091039	0.247	.0004992	.00119	0.676
_cons	-15.9464	8.725996	-1.83			
Logistic regression			Number of obs =94			
			LR chi2 (9) =57.75			
			Prob > chi2 = 0.0000			
Log likelihood = -12.386805			Pseudo R2=0.6998			

Note, **and * indicates significance level at 1%, 5% and 10% respectively***

SEX: The model result indicated that the sex of the household had significant and positively relationship with participation in nonfarm activity at p<5%. This implies that increase male of household by a factor of dy/dx 1.96% and it was positively affect nonfarm activities. This reflects the fact that men have more time commitment to participate in the non-farm activities and have less time commitment to the household activities as compared to women (Amare Demissie and Belaineh Legesse, 2013).

Age of household head: The model result indicated that age of the household head had significant and negative relationship with participation in nonfarm activity at p<5%. This implies that increase in age of household head by a factor of dy/dx 0.00% year will decrease the likelihood of household‘s participation in nonfarm activity. The older the household head, the less the probability to participate in nonfarm employment. This is so since older farmers have gotten used to life in farming and will see leaving the farm for other income generating activities as a distraction. This finding is in line with that of the earlier works done by Roslan and Siti (2011) in Malaysia, Howard and Swidinsky (2000) in Canada and also Matshe and Young (2004).

Educational status of household head: Educational status of household head is one of the major determinant factors in the study area to participate in nonfarm activities. Literate households are better in participating in nonfarm activities. Ellis (2000) states that educational status as one of the major factor which affects rural household‘s participation in nonfarm activity. The effect

educational status of the household head on nonfarm activity participation is positive and statistically significant at p<10%. Being literate would increase the likelihood of household participation in nonfarm activity by a factor of dy/dx 5.19%. As Ellis (2000) indicated, education level of the household head increases the awareness and use of new technologies, and hence will diversify their income sources and high chance of participation in nonfarm activity to escape from risks and the existence of food insecurity in the rural parts.

Nonfarm Training: Nonfarm training on nonfarm activity was found affecting the participation in nonfarm activity in the study area at 1% significance level. This variable has positive relation with participation in non-farm activity. The result indicates the probability of participation in nonfarm activity for the households that have got training was higher by 8.19% as compared to the households that did not get training on nonfarm activity. This result is consistent with findings of (Sosina et al.2012) .The reason is as the training of nonfarm household increase, the ability, skill, awareness and knowledge of house hold also improve to participate in non-farm activities. Therefore, training is important for non-farming participation of households.

Distance from the market: One of determinant of participation in non-farming activity was the distance of farm from market. As the regression result shows, the distance of the farm from the market of the households was found positively affecting the participation in non-farm activity at 10% significance level. As distance of the farm increases by 1 kilometer, the probability of participation in non-farm activity increases by 0.11%. This is revolt with the findings of Mikael Irma (2009).The reason is due to the farmer and most farms found in far from the home, then this would enforce the households to engage more in non-farming activity rather than farming activity.

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary and Conclusion

From descriptive and econometric analysis result the determinant of non-farming activity were affect both positively and negatively the participation of non-farming activity. This particular study would targeted to examined and understand the different nonfarm activities and determinant factors which affect the participation of households in nonfarm activities in Cheha woreda. The household survey through face to face interview was the tool of investigating data about the type of nonfarm activities practiced in the study area, the resources owned and. Numbers of nonfarm income diversification participants in the study area are not still enough and income share from nonfarm income generational activities of the HHs is also lower when compared with the country and developing countries average. In fact, it contributed the second income share ahead of off-farm activities following agricultural income. Poor HHs did it mostly as a full time job than better offs since they lack other alternatives. Better offs did it as apart time job mostly side by side with agricultural activities.

Based on the descriptive statistics result indicated that 55.32% of respondents were participants in nonfarm activities and 44.68 % of the total respondents were non participants in nonfarm activities. The chi-square test indicated that sex of the household, credit access, educational status, nonfarm training and marital status of households had significant relation with participation in nonfarm activities. This implies that male headed households, those who had credit access, literate households, those who took training and married households tend to participate more than their counter parts. The independent T-test also indicated that the age of the household head, land size, distance from the market, family size, dependency ratio, number of livestock had statistically significant mean difference between participant and non participant households.

According to the binary logit model, five of the variables including age of the households, sex of the households, educational status, marital status, number of livestock owned, and distance to the market were statistically significant. The coefficients of age of the household, livestock number and distance from the market all negative. These imply that a unit decrease in age of the farmer and distance from the market would bring about increased participation of farmers in nonfarm income generating activities. Whereas, the coefficients of sex of household head, educational status of household head, marital status, credit access and total family size all are positive. This implies that male of household head; total family size, marital status, literate households and

those all had credit access bring about increased participation in nonfarm activities. In order to analyzed the determinant of household's participation in non-farm activities in Cheha woreda were collected from 94 respondents. The samples were selected by using simple random sampling and the data were analyzed by using descriptive statistics, inferential statics and binary logistic regression analysis methods by SPSS

5.2. Possible Recommendations

- ✓ Educational status and households' non-farm participation had positive significant relation. This indicates that literate households tend to participate more in nonfarm activities than illiterate households. Therefore, the task of upgrading the skills and production techniques of local farmers should be given a special attention. Adult education should also be promoted.
- ✓ Age of the household head and participation in nonfarm activities had negative significant relation. This implies the younger the household head the more participant in nonfarm activities than older households. Therefore, Youth targeted rural entrepreneurship and skill development should be the focus of policy makers in the study area.
- ✓ Additionally, distance from the market had as unexpected to have a negative hypothesis with a result of positive and significant effect on the households' participation in nonfarm activity. This result indicated that there was the government focus on giving special attention for the distribution of infrastructure in the rural area, like road, electricity and pure water supply, so initiated the government because as the market distance increased, and households lack easy access of market for what they produce. But if there is less market distance households could have better access of market, high tendency of engaging in different nonfarm activities near and around the market.
- ✓ The result of chi-square test indicated that there is a significant association between nonfarm training and nonfarm participation of households. This indicates that, those households who took nonfarm training participates more in nonfarm activities. As a result different government and non government organizations should focus on giving both technical & entrepreneurial skill trainings on nonfarm activities.

5.3. Policy implications

- Special efforts need on the promotion of nonfarm opportunities that do not impose barriers to entry through provision of physical infrastructure such as roads, credit, improving educational status and improving irrigation water accessibility. These efforts can be expected not only to directly raise the income levels of the poor who gain access to such jobs but they are also likely to contribute to inequality reduction by raising the wages received by those who remain employed as nonagricultural laborers.
- Infrastructural development especially electricity and road are developed in the area and stated as the basic to join the nonfarm diversification activities. Many nonfarm diversification activities need electricity and marketing different products also need road construction. So, infrastructural development in road, electricity, water, education, health & communication should develop well.
- The responsible body should also give proper attention and follow up to those small scale nonfarm activities. Government should also give attention and support to different nonfarm activities.
- There should be better creation of awareness towards households about the importance of participation in nonfarm activities.

5. REFERENCE

Abduselam Muse, 2011. Diversification of Livelihood Activities as a strategy of promoting food Security a case of Daro Lebu Woreda of West Hararghe, Oromia Regional State. MA thesis, Addis Ababa University, Ethiopia, *91 pp.*

Adams, R.H.J. (2001) 'Nonfarm Income, Inequality, and Poverty in Rural Egypt & Jordan', No.

Amare Demissie and BelainehLegesse, March 2013. Determinants of income diversification among rural households: The case of smallholder farmers in Fedis district, Eastern Hararghe zone, Ethiopia Journal of Development and Agricultural Economics Vol. *5(3), pp. 120-128.*

Bagachwa, M.D., 2009. "Rural Industries and Rural Linkages", in Stewart, F., Lall, S. and S. Wangwe (Eds) Alternative Development Strategies in Sub-Saharan Africa. London: Macmillan.

Barrett, C.B., Reardon, T. And Webb, P. 2001. Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics, and policy implications. In: Food Policy 26 Goteborg University

Barrett, CB., Reardon, T. & Webb, P. 2001. Non-Farm Income Diversification and Household Livelihood Strategies in Rural Africa: Concepts, dynamics, and policy implications. Food Policy, 26: 315–33.

Barrett, C.B., Reardon, T. and Webb, P., 2001. 'Nonfarm Income Diversification and Household Developing Countries.

Benjamin, C. and A. Kimhi (2003), "Farm Work, Off-Farm Work, and Hired Farm Labor: Estimating a Discrete - Choice Model of French Farm Couples' Labor Decisions." Discussion Paper No.5.03 May 2003.

Berdegue, J., Ramirez, E. Reardon, T. & Escobar, G., 2001. Rural Nonfarm Employment and Incomes in Chile. World Development, 29(3): 411-425.

Beyene, A. D., 2008. Determinants of Off-Farm Participation Decisions Of Farm Households In Ethiopia. Agrekon, 47(1): PP 1-22.

Canagarajah, S., 1999. Non-farm Employment, Poverty and Gender Linkage: Evidence from Ghana and Uganda. Working Draft, World Bank: Washington DC.

Carletto, G., 2007. Rural Income Generating Activities in Developing Countries: Re-assessing the evidence. Electronic Journal of Agricultural and Development Economics, 4(1):146-193. (WWW document).

Chapin H., Davidova S. & Gorton M. 2003. Agricultural Adjustment and the Diversification of Farm Households in Central Europe. Contributed paper selected for presentation at the 25th International Conference of Agricultural Economists, August 1622, 2003, Durban, South Africa.

Collier, L., & Reardon, T., 2001. Rural nonfarm incomes in Nicaragua. World.

Collier, P. and D. Lan., 2006. Labor and Poverty in Kenya: 1900-1980. Oxford: Clarendon Press.

Corral, L. and Reardon, T., 2001. Rural nonfarm incomes in Nicaragua. World Development, 29(3), 427–442. Doi: 10.1016/S0305-750X (00)00109-1.

CSA(Central statistics Agency)., 2007. Population census. Development, 29(3), 427–442.doi:10.1016/S0305-750X (00)00109.

Davis, J. 2001. Conceptual Issues in Analysing the rural Non-Farm Economy in Transition Economies. Natural Resources Institute Report: Chatham, United Kingdom.

Davis, J.R., 2003. The Rural Non-Farm Economy, Livelihoods and their Diversification: Issues 1 and Issue 2.

Davis, J.R., 2004. 'The Rural Non-Farm Economy, Livelihoods and their Diversification: Issues and Options', NRI report (2753).

Davis, JR., 2000. The Non-Agricultural Rural Sector in Central and Eastern Europe. In: Lerman, Z and Csaki, C. (eds), The Challenge of Rural Development in the EU Accession Process. World Bank: Washington DC.

Davis, JR. & Bezemer, D., 2004. The Development of the Rural Non-farm Economy in Developing Countries and Transition Economies: Key Emerging and Conceptual Issues. Chatham: Natural Resources Institute.

Davis, J. 2006. Rural Non-farm Livelihoods in Transition Economies: Emerging Issues and Policies. Electronic Journal of Agricultural and Development Economics, 3(2):180– 224. (WWW document). Available at: http:// www.fao.org/es/esa/eJADE (accessed 7 May 2009).

Degefe, T. and Nega, 2011. Rural livelihoods, poverty and food insecurity in Ethiopia: A case study at Erenssa and Garbi communities in Oromiya Zone, Amhara National Regional State (PhD Thesis series 2005:106), Norwegian University of Science and Technology, NTNU, Trondheim.

Deichmann, U., Shilpi, F. & Vakis, R., 2008. Spatial Specialisation and FarmNon-farm Linkage. Policy Research Working Paper No.4611. World Bank: Washington DC.

Deininger, K., S. Jin, B. Adenew, S. Gebre-Selassie, and M. Demeke., 2003. Market and Developing Countries. Agricultural Economics 26(1): 1-23.

De Janvry, A., &Sadoulet, E., 2001. Income strategies among rural households in Mexico: The role of off-farm activities. World Development, 29(3), 467–480.

Janvry, a. & Sadoulet, e. (2005) Income strategies among rural households in Mexico:

De Janvry, A., Sadoulet, E. & Zhu, N., 2005. The Role of Non-Farm Incomes in Reducing Rural Poverty and Inequality in China. CUDARE Working Paper No: 1001. University of California, Department of Agricultural and Resource Economics: Barkely, Califonia.

Devereux, S., 2012. 'Food insecurity in Ethiopia', a DFID Ethiopia Seminar, London.

Ellis, F., 1998. Household strategies and rural livelihood diversification. The Journal of Development Studies, 35(1): 1-38.

Ellis, F. 1999. Non-farm Employment in Tanzania: A Partial Case Study. Chatham: Natural Resources Institute.

Ellis, F., 2000. Rural Livelihoods and Diversity In Developing Countries. Oxford University Press.

Ellis, F. & Mdoe, N. 2003. Livelihoods and Rural Poverty Reduction in Tanzania. World Development, 31(8):1367–1384.

Escobal, J., 2001. 'The Determinants of Nonfarm Income Diversification in Rural Peru', World Development 29(3): 497-508.

Goodwin, Bk. & Mishra, Ak., 2004. Farming Efficiency and the Determinants of Multiple Job Holdings by Farm Operators. American Journal of Agricultural Economics, 86:722-729

Green, W. H., 2000. Econometric Analysis (Fourth Edition). N.J: Prentice Hall: Englewood Cliffs.

Gujarati, 2004. Basic Econometrics, Fourth Edition, the McGraw−Hill Companies.

Haggblade, S., Hazell, P. & Reardon, T., 2005. The Rural Non-farm Economy: Pathway out of Poverty or Pathway in?. In International Food and Policy Research Institute-IFPRI (Ed.), The Future of Small Farms: Proceedings of a research workshop. IFPRI: Washington DC, 151-178.

Haggblade, S., P.B.R. Hazell and T. Reardon (Eds), 2007. Transforming the Rural Nonfarm Economy: Opportunities and Threats in the Developing World. (1st edn). Baltimore: International Food Policy Research Institute.

Haggblade, S., Hazell,P., and Reardon, T., 2008. Strategies for stimulating poverty alleviation growth in the rural non-farm economy in developing countries. EPTD Discussion Paper No. 92, PP 126.

HazelL PB. & Haggblade, S. 1993. Farm-non-farm growth linkages and welfare of the poor. In Lipton M. and Van der Gaag J (Eds), Including the poor: Proceedings of a symposium organised by the World Bank and International Food and Policy Research Institute . World Bank. Washington DC 190-204.

Hazell, P. and Haggbalde, S., 2004. The rural non-farm economy: prospects for growth and poverty reduction. World Development, Vol.38, pp. 1429–1441.

Hazell, P, Haggblade, S. & Reardon, T. 2007. Transforming the Rural Nonfarm Economy. Johns Hopkins Press: Baltimore, 3-25.

Howard, W. and M. Swidinsky, 2000. “Estimating the Off-Farm Labor Supply in Canada”, Canadian Journal of Agricultural Economics, 48:1, pp. 1-14

Hussein, K. & Nelson, J., 1999. Sustainable Livelihoods and Livelihood Diversification. Institute of Development Studies-IDS: Working Paper No. 69. Institute of Development Studies: Brighton.

Ibekwe, u.c; eze,c.c;ohajianya, d.o; orebiyi.j.s; onyemauwa,c.s and o.c. korie, 2010. Determinants of non-farm income among farm households in south east Nigeria department of agricultural economics, federal university of technology, lmostate,Nigeria pp 1-5.

International Labor Organization (ILO)., 2007. World Employment Program; Ethiopia towards sustained employment promotion: Jobs and Skills Programme for Africa (JASPA). Addis Ababa: ILO.

Islam, R., 2007. "Rural Industrialization and Employment in Asia: Issues and Evidence", Chapter 1 in Islam, R. (ed.) Rural Industrialization and Employment in Asia. New Delhi: International Labor Organization, ARTEP.

Kueper, M., Neijerink, G. & Eaton, D., 2006. Rural Livelihoods: Interplay between Farm Activities, Non-farm Activities and the Resource Base. Agricultural Economics Research Institute: The Hague, Netherlands.

Lanjouw, JO. & Lanjouw, P. 1995. Rural Non-farm employment: A survey. Policy Research Working Paper No. 1463. World Bank: Washington DC

Lanjouw, Jo. & Lanjouw P., 2001. The Rural Non-Farm Sector: Issues and Evidence from Developing Countries. Agricultural Economics, 26: 1-23.

Lanjouw, J., 2005. The Rural Nonfarm Sector: Issues and Evidence from Livelihood Strategies in Rural Africa: Concepts, Dynamics, and Policy Implication', Food.

Lanjouw, J., 2009. Rural Non Farm Employment: A survey World Bank Policy Research.

Lanjouw, P. & Shariff G. 2004. Rural Non-Farm Activities and Rural Development: From Experience towards Strategy. Rural Development Strategy Background Paper No.#4. The World Bank Rural Development Family. World Bank: Washington DC.

Mduma, J., and P. Wobst. 2005. Determinants of Rural Labor Market Participation in Tanzania. African Studies Quarterly 8(2). Http://www.africa.ufl.edu/asq-/v8/v8i2a2.htm. Accessed July 2010.

Matshe, I. and Young, T. (2004). Off-farm Labour Allocation Decisions in Small-Scale Rural Households in Zimbabwe. Agricultural Economics, 30: 175-186.

Mishra, A. & Goodwin, B., 1997. Farm Income Variability and the Supply of Off farm Labour. American Journal of Agricultural Economics, 79: 880-887.

Mishra, 2007. Effective Aid for Small Non Farm in Sub Saharan Africa: Southern Civil Society.

Mulat, D and Teferi., 2010. Off-farm Income Generation in Ethiopia: Opportunities and Constraints in Food-insecure Woredas of Oromiya and Amhara Regional States. Ethiopian Development Forum: vol 2. No 1.

Nelson, F.D. 1999. Linear probability, logit and probit models. Stage publication, London

O' Brien, M. & Hennessy, T. 2006. The Contribution of Off-Farm Income to the Viability of Farming in Ireland. RERC Working Paper 06WPRE13. (WWW document). Available at: http:// www.tnet.teagasc.ie/rerc/workingpapers (accessed 27 February 2008).

Parrott, N., P. Hebinck and A. Westendorp (2006) "'Livelihoods" - Module', The Netherlands. Wageningen University.

Ranjan Sharad. 2006. "Occupational Diversification And Access To Rural Employment: Revisiting the Non Farm Employment Debate," MPRA Paper 7870, University Library of Munich, Germany.

Reardon, T., 1997. Using evidence of household income diversification to inform study of the rural nonfarm labor market in Africa. World Development, 25(5), 735–747. Doi:10.1016/S0305-750X(96)00137-4.

Reardon, T. Stamoulis, A., Balisacan, M.E., Berdegue, J, and Banks, B., 2001. Rural Non-farm Income in Latin America.

Reardon, T., 2002. Rural non-farm employment and incomes in Africa.

Reardon, T., 2009, "Rural Non-farm Incomes in Developing Countries". Paper Prepared for the Financial Assistance Policy, FAO. Washington, D.C, 20433, USA.

Roslan, A. R and H. C. Siti (2011), "Determinants of Farmer's Participation in Off-Farm Employment: A Case Study in Kedah Darul Aman, Malaysia" Asian Journal of Agriculture and Rural Development, 1(2): 27-37

Ruben and Vandebercy, 2001. 'Nonfarm Employment and Poverty Alleviation of Rural Farm Household in Honduras', World Development 29(3): 549-560.

Sharad, R. 2006. Occupational Diversification and Access to Rural Employment: Revisiting the Non Farm Employment Debate (WWW document). Available at: http://mpra.ub.uni-muenchen.de/7870/ Munich Personal RePEc Archive MPRA Paper No. 7870 (accessed 2 August 2008).

Siti Hadijahchemat and Roslan Abdul-Hakim., 2010. Does Farmer's Diversification into nonfarm employment reduce their likelihood of poverty? Evidence in Malaysia 1:10pp.

Smith, I., 2000. Agricultural Household Models: Extensions, Applications.

Smith, DR., Gordon A., Meadows K. & Zwick K., 2001. Livelihood diversification in Uganda: patterns and determinants of change across two rural districts. Food Policy, 26: 421–435.

Smith, 2007. Livelihood diversification in Uganda: Patterns and determinants of change across two rural districts. Food Policy, 26(4), 421–435. Doi: 10.1016/S0306- 9192(01)00012-4.

Tassew W., 2000.Economic Analysis and Policy Implication of Farm and Off-farm employment: A case study in the Tigray Region of Northern Ethiopia. Wageningen University, Netherlands.

Tommy T., 2012. Beyond Agriculture: Diversification of Household income in the Ethiopian highlands. MA thesis, the Faculty of the Graduate School of Arts and Sciences of Georgetown University, Washington, 47 pp.

Woldehanna, T., 2000. Income diversification and entry barriers: evidence from Tigray region

Working paper no 1463, May.

Woldehanna, T. & Oskam, A. 2001. Income Diversification and Entry Barriers: Evidence from the Tigray Region of Northern Ethiopia. Food Policy, 26: 351–365.

World Bank, 2007. World Development Report. Agriculture for Development. Washington DC, 386pp.

Yúnez-Naude, A., and Edward Taylor, J. (2001). The Determinants of Nonfarm Activities and Incomes of Rural Households in Mexico, with Emphasis on Education. World Development,29(3), 561–572. doi:10.1016/S0305-750X(00)00108-X

6. APPENDIX

Appendix 2. Logistic Regression and marginal effects after logit

```
Iteration 7:   log likelihood = -12.386805

Logistic regression                               Number of obs   =         94
                                                  LR chi2(9)      =      57.75
                                                  Prob > chi2     =     0.0000
Log likelihood = -12.386805                       Pseudo R2       =     0.6998
```

NFP	Coef.	Std. Err.	z	P>|z|	[90% Conf.	Interval]
SEXHH	3.413915	1.690094	2.02	0.043	.6339586	6.193871
AGEHH	-.1315013	.0549336	-2.39	0.017	-.221859	-.0411435
EDUSHH	4.770797	2.490626	1.92	0.055	.6740817	8.867512
MARSHH	2.596981	1.952561	1.33	0.184	-.6146972	5.808658
TFMSIZE	.3297729	.2878673	1.15	0.252	-.1437266	.8032725
CREDACCES	3.198054	2.00682	1.59	0.111	-.1028709	6.498979
NONFATRAIN	6.21926	2.179672	2.85	0.004	2.634019	9.804501
DISMKT	1.040031	.5638334	1.84	0.065	.1126071	1.967454
NOLIVESTOCK	.4737592	.4091039	1.16	0.247	-.1991568	1.146675
_cons	-15.9464	8.725996	-1.83	0.068	-30.29939	-1.593417

```
Note: 0 failures and 5 successes completely determined.

. mfx

Marginal effects after logit
      y  = Pr(NFP) (predict)
         =  .99894512
```

variable	dy/dx	Std. Err.	z	P>|z|	[95% C.I.]		X
SEXHH*	.0196464	.03458	0.57	0.570	-.048131	.087424	.87234
AGEHH	-.0001386	.00028	-0.49	0.623	-.000691	.000414	40.8723
EDUSHH*	.0519564	.05946	0.87	0.382	-.064578	.168491	.829787
MARSHH	.0027366	.00559	0.49	0.624	-.008221	.013694	1.8617
TFMSIZE	.0003475	.00072	0.48	0.628	-.001057	.001752	5.3617
CREDAC~S*	.0151492	.02652	0.57	0.568	-.036837	.067135	.851064
NONFAT~N*	.0720892	.08186	0.88	0.379	-.088354	.232533	.691489
DISMKT	.001096	.0022	0.50	0.619	-.003221	.005413	6.7766
NOLIVE~K	.0004992	.00119	0.42	0.676	-.00184	.002839	1.19149

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

APPENDIX: 2 Conversion factor for Tropical Livestock Unit (TLU)

Animal category	Livestock Unit (LU)
Calf	0.25
Weaned calf	0.34
Heifer	0.75
Cow and ox	1.00
Horse	1.10
Donkey (adult)	0.70
Donkey (young)	0.35
Sheep and goat (adult)	0.13
Sheep and goat (young)	0.06
Chicken	0.013

Source: Stock *et al*. (1991); (as cited in Ermiyas).

Appendix 3 survey questionnaire

Interview information

DIRECTION: circle the letter that you choose and write on the space provided for the essay part.

This interview schedule is designed to find out the determinants of households participation in non- farm activity in Cheha woreda. The objective of the study is purely academic and the interview is prepared to collect relevant data which is believed to come up with valuable recommendation for problems we observed. So, your value support in responding to the questions raised is very important for the success of our study.

I. Household Characteristics

1. Sex of the respondent1. Male --------- 2.Female-------

2. Age of the respondent …… year

3. Marital status of the respondent A. single B. married C. divorced D. widowed

4. Educational status 1. Literate 2. Illiterate

4.1. If literate, years of schooling ……

5. How many persons belong to your household (HH members)? Male----Female----Total.....

6. What is your major occupation? A. Smallholder Farmer B. Small Scale Business

C. Worker (employed) D. Other (Specify)

8. Have you ever attended in non- farm training? A. yes B. no

8.1 If yes, specify the benefit obtained from non-farm training? ……..

9. How far is the distance from your home to the market?

A.2km… B.3km….. C.4km…… …. D. Other (specify)……

10. Have you ever had credit access? A. yes B. no

11. If your answer is yes, what amount of credit you took (birr)? ……..

II Income sources of family

12. What are the main source(s) of your income?

A. crop production B. livestock rearing C. other (specify)……..

III participation of non farming income

13. Did you or any member of your household engage in non-farm activity? 1. Yes 2. No

14. If your answer is yes what type of activity do you or your household member performs?

No	Activity	Yes	No	Income obtained	Income shares in %
1	Petty trade				
2	Carpentry				
3	Masonry				
4	Hiring out labour				
5	Tannery				
6	Pottery				
7	Black smith				
8	Local distilling				
9	Handicrafts				
10	Commercial activities (trade and transportation)				

15. Why did you start your non-farm activity? A. Family tradition D. Small investment is required

B. To be self-employed E. No other alternative for incomes

C. Brings high income F. Others (Specify) ----------

16. Who initiated and helped you to start the non- farm activity?

A. Myself B. my family's C. my friends d. others (specify)

17. Which is better for you in terms of generating income?

A. farming activities B. non-farm activities

18. What it looks like the attitude of other societies about your non-farm activity?

A. Encouraging B. Discouraging C. Neutral

20. What do you think about the contribution of non-farm activities in changing the living standard of your family? A. It is efficient B. it not efficient C. it is enough D. it is not enough

21. What problems did you face while running non farming activities in relation to?

A) Economic factors · Market ·Finance (startup budget)· Technolog· Training ·Raw material & other

B) Social factors · Public acceptance · Attitude toward non-farm activity

C) Legal and Administration factor -Government policy

22. Did you perform both farming and non farming activity? A. Yes B. No