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DETERMINANT OF INCOME SOURCE DIVERSIFICATION AND ITS
CONTRIBUTION TO LIVELIHOOD IN THE CASE OF ABIY-ADDI
TOWN.

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DEVELOPMENT POLICY ANALYSIS SPECIALIZATIONS.

BY:

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Declaration

This is to certify that the thesis work by Berihu Knfe Mekenen entitled: Identify Determinants of Income source Diversification and its Contribution to Livelihood in case of Abiy- Addi Town, submitted in fulfillment of the requirements for the Degree of Master's of Science (Development policy and Analysis) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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List of Acronyms

CSA = Central Statistics Agency

DECSI = Dedebit Credit and Saving Institution

ERHS = Ethiopian Rural Household Survey

FAO = Food Aid Organization

GTP = Gross Transformation Plan

NGOs=Non-Governmental Organizations

MFIS =Micro Finance Institution

MSES=Micro and Small Enterprise

OLS=Ordinary Least Squares

RNFAs=Rural Nonfarm Activities

SPSS = Statistical Package for Social Science

TBOARD= Tigray Bureau OF agriculture and Rural Development

ABSTRACT

This study, titled “Determinants of Income Source Diversification and Its Contribution to the Livelihoods of Urban Households: The Case of Abiy-Addi Town,” examines the socioeconomic and institutional factors influencing income diversification among urban households and evaluates its contribution to livelihood enhancement. Conducted in Abiy-Addi Town, Central Zone of Tigray, Ethiopia, the research employed a cross-sectional design integrating quantitative and qualitative approaches. Data were collected from 376 randomly selected households through structured questionnaires and direct observations, supplemented by secondary information from reports and literature. Descriptive results indicated that the average household head was 46.9 years old, with a mean family size of 5.47 and an average education level of 2.7 years of schooling, reflecting low human capital. Approximately 72.6% of households participated in non-farm or off-farm income-generating activities, mainly in trade, construction, and services. However, only 48.7% had access to credit, with high interest rates and lack of collateral serving as major obstacles to diversification. The Poisson regression model identified key determinants of income diversification, revealing that education level, family size, access to credit, extension services, and training significantly and positively affected the degree of diversification. A one-year increase in education raised the likelihood of engaging in additional income-generating activities by 0.31, while access to credit increased diversification probability by 0.42. Conversely, older and female-headed households were less likely to diversify due to limited resources and cultural constraints. The model diagnostics confirmed the absence of overdispersion, validating the model’s specification. To estimate the welfare impact of diversification, Propensity Score Matching (PSM) was applied using covariates such as age, education, credit access, and training. The estimated Average Treatment Effect on the Treated (ATT) showed that diversified households earned significantly higher incomes (54,046 Birr) compared to non-diversified ones (23,649 Birr), implying that diversification nearly doubled annual income levels. Diversified households were also more food secure and less vulnerable to income shocks. These findings are consistent with Ellis (2000), Woldehanna (2000), and Fikru (2008), who underscored non-farm diversification as a key strategy for reducing poverty and improving household welfare in Ethiopia and Sub-Saharan Africa. Institutional and infrastructural challenges—including high loan interest rates, limited working premises, inadequate training centers, and poor market linkages—were found to constrain diversification. Strengthening microfinance systems, improving urban infrastructure, and expanding vocational training are therefore essential policy measures. In conclusion, the study confirms that income source diversification substantially contributes to improving urban household livelihoods in Abiy-Addi Town. Promoting non-farm sectors such as small-scale manufacturing, agro-processing, and construction enhance income stability, economic resilience, and urban employment opportunities. Integrating these strategies into local development policies is crucial for achieving sustainable urban growth and poverty reduction.

Keywords: Income diversification; Poisson regression; Propensity Score Matching (PSM); livelihood; non-farm activities; Abiy-Addi Town

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

The concept “nonfarm activities” is defined in many ways by different authors. The non-farm sector refers to all other activities outside the farm sector and agricultural wage employment. Non-farm activities are important to the livelihoods of rural households and should occupy a central position in policies addressing the development problems in Africa (Mohammed Seraje 2007). The rural non-farm sector not only contributes directly to rural households' income, that creates employment opportunities, but also provides input supplies to the farming sector, and value-adding opportunities for the farm product venues. A well non-farm sector should be able to employ marginal farmers who leave agriculture because they can no longer survive in farming. A growing interest in the rural non-farm sector reflects the increasing realization that rural people’s livelihoods are derived from diverse sources and are not as overwhelmingly dependent on agriculture as previously assumed. Moreover, policy makers are looking at the wider rural economy to reduce persistent rural poverty and rural-to-urban migration (Davis, J. R. and Bezemer, D., 2004, as cited in Tesfaye, 2010).

The Ethiopian Rural Household Survey (ERHS) showed that 24.3% of the sample farm households participate in off-farm activities. Accounting for about 83%, the widely reported off-farm employment opportunities (employers) are public work programs administered by either the government or Non-Governmental Organizations (NGOs) as an ‘employment-based safety net’ for small farmers. Agricultural wage employment is the other equally important source of employment that accounts for 24% while 81.9% of the representative sample reported that the main reason for participation is low and fluctuating farm income (ERHS, 1999).

Subsequent survey results from the ERHS have revealed a remarkably increasing rate of participation in the off-farm economy, with 47.4% in the year 2004 and 51.2% in 2009. And, the source of off-farm employment opportunities has significantly shifted from public work programs (usually food-for-work, cash-for-work and employment-generating schemes), which accounted for about 39% in 1999 and 2004 rounds of surveys, to the low-skilled non-farm activities, paid agricultural employment and ritual practices, in that it accounts for only 8.2% in 2009 (ERHS, 2004; 2009). This is in line with several empirical studies which indicated that off-farm activities indeed occupy an important place in rural economies throughout the developing world (Hazell and

Haggblade, 1993, cited by *Woinishet Asnake, 2010*). The important implication of the foregoing evidence is that rural farm households can reasonably diversify their income sources by pursuing a dual career (allocating household labor between farm and off-farm activities). Accounting for some proportion of the total income of participating households, earnings from off-farm engagements are important primarily for the economic well-being of households. Essentially, off-farm employment and income opportunities can fill the income-expense gap for households who choose farming as their lifestyle; increase households' cash flow to effectively carry out farm operations; serve as a buffer for farm income fluctuations and hence a prudent risk management offsetting unexpected variation in income (Mishra and Goodwin, 1997, cited by). Thus, off-farm income opportunities can smooth household income that fluctuates with unpredictable farm income shocks for which farm households may reasonably consider their participation in off-farm employment as a permanent engagement rather than a temporary or transitional pursuit.

In Ethiopia, the expansion and dynamism of non-farm activities, on the one hand, and the concomitant opportunities of non-farm employment and income for the growing labor force, on the other hand, are integral elements of the ongoing rural economic transformation since the reform period, and possibly in the GTP period. Several rural development programs and farm policies, which are put in place to engender the economic transformation, can affect the rural labor market and thereby the microeconomic behavior of farm households in allocating rural labor, calling forth context-specific empirical analysis of farm households' choice.

The relative importance of farm, family, financial, and local economic characteristics to decisions by the farm households is crucial to understanding the structural change and the ongoing process of economic transformation. Specifically, there is a famine of systematic and rigorous studies that dealt with farm households' allocation of labor (labor market) in the Tigray regional state.

1.2 Statement of the Problem

In Ethiopia, many researchers have examined sustainable livelihoods strategies, livelihood and food security, sustainability and resilience of livelihoods, livelihood diversification, and rural non-farm livelihood activities. Some studies attempted to assess historical trends, driving forces of diversification, and contributions of the non-farm sector to the national economy across time. However, according to Tassew (2002 as cited in Reta, 2010), policy makers were favoring agriculture as a means of rural Ethiopia (agricultural-led industrialization economy) undertakes relatively fewer non-farm opportunities compared to other developing countries. Rural development policies often neglect the role of rural non-farm activities and their link with

agriculture. This might be because the role of the rural non-farm sector is the least understood component of the rural economy; its role in the broader development process is not well known (Lanjouw and Lanjouw, 1997). This knowledge gap has been reflected in the policies of developing countries such as Ethiopia, where no development policy identifies and includes the rural non-farm sector. The importance of the rural non-farm sector in decreasing rural-urban migration and its potential role in absorbing the growing rural labor force, thus contributing to the national economy and promoting a more equitable distribution of that income.

The empirical evidence on the size and economic significance of the Ethiopian non-farm activity is very limited and largely suggests that there is little diversification beyond agriculture in rural areas (Rijkers and Costa, 2012). According to this evidence, some 20 to 35% of rural households in Ethiopia are engaged in nonfarm activities; compared to 40 to 50% in Sub-Saharan Africa and 60% in South Asia; this shows that the role of non-farm activities in Ethiopia is downplayed. There is an argument in the literature regarding the contribution of RNFEs. The nature of the links between the farm and non-farm economy and the performance of agriculture influence the growth of the RNFE. With increasing diversification, the links to agriculture tend to decrease. In many developing countries, the seasonal character of the RNFE is inclined to decrease with increased diversification and to show a trend towards more constancy (Barrett and Reardon, 2000). The often exists apposite of RNFE activities with: higher income level for rural families; higher potential for diversification of income sources (RNFE); and higher productivity in agricultural activities.

One view is that non-farm activities provide an active pathway out of poverty (Tegegne, 2001). A less positive view is that non-farm activities are set up by households primarily as a survival strategy, perhaps as a substitute for agriculture for the landless (Mulatu and Teferi, 1996, cited by *Mohammed Seraje, 2007*). This shows that the role of RNFAs in Ethiopia is still controversial and needs a study. Since the characteristics, level of operation, as well as constraints of these activities vary from place to place, local level intervention may not be an easy task. Micro-level research can provide an input for enhancing poverty reduction. Sound poverty reduction strategies, thus, need to consider the contributions, opportunities, and constraints of non-farm Activities for rural households' livelihoods in a manner that promotes agriculture in the broader context of facilitating the transition from farm to non-farm occupation in Ethiopia. Even if different research has been done in different areas of Ethiopia, there is no research which have

been done before this time about the determinants of income source diversification, livelihood, and to assess the role of non-farm activities in sustaining the urban livelihood in this study area. This study gives greater emphasis and a deeper focus to inform government agencies, NGOs, and donors about the development and constraints of the urban non-farm diversifications and their role in the study area. In line with the issues discussed above as a backdrop, this research identifies determinants of income source diversification and assesses the role of non-farm activities in sustaining the urban livelihood of Abiy-Addi town. This research addresses the following questions

1.3. Research Questions

1. What are the patterns of urban households' non-farm income?
2. What are the demographic characteristics that determine the urban households' non-farm activities?
3. What is the impact of the non-farm activities on the income diversification of the rural households?

1.4. Objective of the study

1.4.1 General objective

- The overall objective of the study is to identify determinants of income source diversification and to assess the role of non-farm activities in sustaining the urban livelihood of Abiy-Addi town.

1.4.2 Specific objective

1. To identify the pattern of non-farm income of the study area.
2. To identify the demographic characteristics that determine the non-farm activities.
3. To estimate the impact of non-farm diversification.

1.4 Significance of the Study

It is believed that the findings of this study serve as a resource of secondary data for those who are interested to conduct further study on issues related to non-farm activities in sustaining the urban livelihood. Besides, results of this study could be seen as important inputs for understanding

of major determinants and constraints of non-farm livelihood activities diversifications, agro ecology and non-farm livelihood diversification and outcomes of non-farm livelihood diversification in urban area. This study also use some value both from academic and policy points of view to identify determinants of income source diversifications livelihood and to assess the role of non-farm activities in sustaining the urban livelihood. Furthermore, the findings of this study be used as inputs for future action that would be undertaken by governmental and nongovernmental organizations working in the area.

1.5 Scope and Limitations of the Study

The study was conducted in Abiy Addi Town, the central zone, and the Tigray regional state. The study was conducted to identify the determinants of income source diversification and to assess the role of non-farm activities in sustaining the urban livelihood of Abiy-addi Town. The study was limit by the accessibility of resources, time to undertake the study on a wider scale, the unit of analysis for this study is the household; this is because the household is not a homogeneous unit; rather, it is internally complex with different members (men, women and children) having different roles and self-government of control over resources including those crucial for UNFAs. Therefore, information obtained from a single member of a family (head of the Household) might not represent others. The data collection for the study was conducted on selected households of Abiy-Addi town. The study uses mainly a cross-sectional survey supported by key informants and observation. The degree of precision for sampling size is 5 % taking into consideration the budget and time limitations. Accordingly, 376 samples were taken. Except for the limited sample size due to resource limitations, all the remaining methodological precautions would have been taken care of to enhance the quality of the research to the level to be best. Another limitation is on the literature reference in the area studies made based on Determinant of Income Source Diversification and Its Contribution to Household Livelihood were a few in the Ethiopian urban household survey. As a result, it becomes difficult for this study to compare the results with other similar studies. In addition to this, the study has focused on Determinants of Income Source Diversification and Its Contribution to Livelihood on its determinant factors due to time and cost constraints.

1.6 *Organization of the Paper*

This paper was organized into five major chapters. The first chapter included background, statement of the problem, objective of the study, significance of the study, and scope and limitations of the study. The second part deals with a related literature review that includes conceptual and theoretical frameworks of rural Determinant of Income Source Diversification and empirical studies made in the country and elsewhere in the world. The third chapter presented the methodology of the study. The findings of the study are presented in the results and discussion part in Chapter Four. Finally, chapter five presents the conclusion and recommendations that are drawn from the study.

CHAPTER TWO:

2. Related Literature Review

2.1 *Concepts and Definitions*

The extant theoretical literature on diversification lacks common definitions or well-established Conventions on the collection or classification of data or on the use of indicators to capture observed diversification behaviors. This lack of a standard approach impedes effective comparative analysis and too often leads to mistaken inference (Barrett et al, 2001). One of the common sources of confusion in the literature (Barrett et al, 2001; Gordon and Craig, 2001, as cited in Tesfaye Aleka, 2010) is the inconsistent use of terminology. The terms “off-farm,” “non-farm,” “non-agricultural,” “non-traditional,” “rural enterprises,” “rural informal sector,” “rural industries,” etc., routinely appear in seemingly synonymous ways. Before embarking on a study of non-farm urban activities, it is also necessary to identify what is meant by both „rural“ and “non-farm”. Gordon and Craig (2001) observe that the term “rural” is subject to a large amount of debate, hanging on three particular aspects: whether rural towns are rural or *urban*, at what size does rural settlement become urban, and the treatment of migration and commuting between rural areas and towns. There is no firm rule that resolves these issues, and the only practical solution is for the researchers to make sure what they have adopted is clearly stated.

2.2 *Non-farm rural livelihood diversification*

Rural livelihoods analysis is believed to have been born with the birth of peasant studies in the 1960s, given the dominance of peasant modes of production in many newly independent African countries. Though ‘peasant studies’ has fallen out of fashion, the concepts and theories are still central to an understanding of rural livelihoods (Start and Johnson, 2004 as cited in Fikru: 2008). Ellis (1998, 2000) has elaborated a framework which describes the context within which rural non-farm livelihood activities are undertaken. In this framework, different livelihood activities of rural households are enabled by access to assets, in the context of institutions and social relations, modified by trends and shocks, with effects on livelihood security and environmental sustainability (Fikru 2008 cited in Birhanu 2016)

2.3 *Off-farm Activities and Income in Ethiopia*

According to (Woinishet, 2010), the Ethiopian economy is based on agriculture, which is the largest contributor to the economy that accounting for nearly 80% of employment and 45% of the

national GDP¹. However, agriculture in Ethiopia is characterized by low labor productivity, a decline in farm size, soil degradation, subsistence farming, tenure insecurity, lack of financial services, imperfect agricultural markets, and poor infrastructure (Beyene 2007) cited (Degefe and Nega 1999). There are mainly two production systems in Ethiopia: i) crop-livestock mixed production in high and mid altitude areas, and ii) pastoral and agro-pastoral production systems in lowlands. Agriculture in Ethiopia is characterized by a traditional method of farming, mainly relying on animal traction, and is rain-fed. The dominant type of farm input is family labor power. Cereals, pulses, oil crops, cash crops, fruit, and vegetables are grown yet the extent varies with location. The country faces fluctuation in agricultural productivity due to weather or manmade related shocks. In Ethiopia, participation in off-farm activities is increasing among rural households.

According to Rijkers et al. (2002), non-farm enterprise makes considerable contributions to rural income, and approximately 25% of all households in rural Ethiopia own one or more non-farm enterprises; however, about 2% of households exclusively rely on non-farm enterprises. Off-farm activity in Ethiopia includes wage work and self-employment. Wage work, in turn, includes farm wage work, professional wage work (e.g. lecturers), skilled laborer (e.g. mechanics), unskilled wage work, and community work. The employers could be small and/or commercial farmers, NGOs, government organizations, urban dwellers, religious institution, and contractors. Self-employment includes milling, weaving, and handicraft; trade in grain and livestock, Collecting and selling firewood and selling local food and drinks. Enterprises dealing with milling, livestock and grain trade are relatively profitable. The non-farm activities in Ethiopia are almost labor intensive.

According to Rijkers et al. (2002), enterprises in Ethiopia do not seem to operate in a sub-optimal scale. The production technology of the existing firms 'exhibit constant returns to scale, hence, at their existing stage there are no unexploited scale economies. The author's state that almost all enterprises in rural Ethiopia are stagnant. The reason for lack of investment could be high-risk and uncertainty associated with variability in agricultural performance due to weather fluctuations. In addition, there are low wage rate and low returns from self-employment activities. Nevertheless, enterprises located in rural towns are relatively profitable than those located in far distant remote areas. However, the number of households engaged in high earning professional activities is lower due to the lower educational status and less number of enterprises that could provide employment opportunities. In the previous Ethiopian Government, (1974-1991) the

agricultural policy advocated for collective and state-owned farming and non-farm systems. Hence, private ownership of resources was very restricted. Government support like training and finance was restricted to cooperatives and state-owned enterprises.

According to Woldehanna (2002), during this period, nationalized public institutions were given responsibility to promote non-farm sector but efforts directed towards cooperatives on which individuals trained in crafts were unable to establish themselves because they lacked credit, tools, raw materials and business skills. After 1991, the economy of the country was liberalized, individual property rights were allowed and participation to non-farm activities substantially increased. However, according to Woldehanna (2002), even though the policy of the current government emphasizes both farming and non-farm sector, the focus of the economic reform is exclusively on farming sector.

2.4 Non-Farm Diversification and Poverty Reduction

The income-diversification literature converges on an estimate of roughly 40 % of African rural household income on average being resulting from non-farm sources (Bryceson, 1999). Because non-farm earnings constitute an even larger portion of cash income (Haggblade, et al., 1988). Even if the influence of non-farm pays on relative income equality is unclear or negative, access to non-farm earnings however improves the absolute income levels of the poor. The non-farm subdivision offers potential to absorb a rising rural labor force, slow rural - urban migration, contribute to national income growth, and promote a more equitable distribution of income (Lanjouw and Lanjouw, 1997 cited in Fikru Tesfaye 2008).

Given low capital supplies and the small scale nature of numerous rural non-farm enterprises, poor households control many of them. For these details, policy makers are progressively forced to view the rural non-farm economy as a potentially important donor to foster local economic growth and improve the rural-urban income gap and rural poverty (Davis and Bezemer, 2004). There is thus a developing consensus that poverty declines as the share of income from non-agricultural bases rises. The harms of agriculture and large scale activities in African countries reinforce this view. Four welfare important roles of the rural non-farm sector are usually highlighted in the literature:

- the non-farm sector increases the incomes of marginal producers, and by this decreases inequality and poverty,
- during the loose season, farm households find a second employment and income source,

- Many farm households have a hard time even achieving the subsistence level by means of agriculture for rural setting then, non-farm activities serve also the purpose of generating cash income,
- Various linkages between the non-farm sector and the agricultural sector are being generated that might enhance also agricultural production and / or productivity and hence rural development (Tegegne, 2000).The poor normally remain limited to the low-return section of the rural economy. Policy creators are thus instructed not to believe that an expanding rural non-farm economy inescapably translate into declining poverty. However, while these deeds do not lift the poor outside poverty, they have great role in protecting the poor from further declines in income.

2.5 Potential role of rural nonfarm activities in poverty alleviation

The RNFA is of interest to governments, bilateral and multilateral donor agencies, NGOs and development practitioners because of its increasing prevalence in both developing economies (Gordon and Craig, 2001).The role of RNFAs in rural livelihoods can be understood in terms of proportions of income, employment, allocation of time and its relationship with household level vulnerabilities, risk-coping and risk-dispersing mechanisms (Mishra, 2007).Most recent studies agree that RNF income plays an important role in terms of its share in household's income, time use and diversification strategies. According to DFID (2002) cash and in-kind RNF income is a substantial contribution to total household income. The contribution from the RNFAs alone is 40–45% in sub-Saharan Africa, Latin America and South East Asia, and 30–40% in South Asia. Including urban income, total RNFAs contributions may be closer to 70% in some cases. Loening et al (2008) shows that some 10 to 35 percent of rural households in Ethiopia are engaged in nonfarm enterprise activities. In most areas, these shares have been rising as smallholder farming is threatened by weakening international terms of trade and, more debatably, corporatization throughout contracting. This leads to the question: what can be done to enhance existing self-employment opportunities for the poor?

In general, rural non-farm activities may (Gordon and Craig, 2001; Davis et al, 2004):

- i. absorb surplus labor in rural areas especially during the agricultural off season;
- ii. Help farm-based households spread risks;
- iii. Provide a means for the rural poor to cope or survive when farming fails;

iv. Offer income potential during the agricultural off-season;

V. exploit rural comparative advantages (resources, location, labor costs);

vi. Foster rural growth;

vii. Offer a means for asset improvement: Cash resources obtained from diversification may be used to invest in, or improve the quality of, any or all of the five classes of assets;

viii. Improve the overall quality of life, goods and services in rural areas;

ix. Further indirect effect occurs where RNF income enables poor households to overcome credit and risk constraints on agricultural innovation (Ellis, 1998). Moreover, Studies on RNFAs in the country mainly focus on the direct importance (economic significance) of handicraft works and utilitarian purposes of the products. However, the significance goes beyond and the utensils that are shaped may have additional socio-cultural values. In other words, a pot shaped by a potter is not only for functional/utilitarian purposes (e.g. for steaming, boiling, storage etc.) but also for social and non-utilitarian or symbolic values (e.g. self-expression and identity marks) which can be sources of tourism industry. Further, women's skills in embroidery, weaving, and basket making are not only means for generating income but also sources of social and emotional independence for them (Sirika, 2008: 9). Given low capital supplies and the small scale nature of numerous rural non-farm enterprises, poor households control many of them. For these details, policy makers are progressively forced to view the rural non-farm economy as a potentially important donor to foster local economic growth and improve the rural-urban income gap and rural poverty (Davis and Bezemer, 2004). There is thus a developing consensus that poverty declines as the share of income from non-agricultural bases rises. The harms of agriculture and large scale activities in African countries reinforce this view. Four welfare important roles of the rural non-farm sector are usually highlighted in the literature:

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rural development (Tegegne, 2000). The poor normally remain limited to the low-return section of the rural economy. Policy creators are thus instructed not to believe that an expanding rural non-farm economy inescapably translate into declining poverty. However, while these deeds do not lift the poor outside poverty, they have great role in protecting the poor from further declines in income.

2.6 The importance of location for non-farm employment

Promoting non-farm employment is gaining attention as a strategy for reducing poverty (Ellis and Harris, 2004; Vander Walle and Cratty, 2003; Pender, 2000). The scope for rural non-farm employment however is to a large extent determined by geographical factors. The role of geography in economic development is well known, dating back to the work of von Thune in 1810 stressing the importance of distance to urban areas. Based on distance to urban areas we can distinguish three different zones: pre-urban, countryside and remote rural areas, each with different likely activities. Access to urban markets is important for selling agricultural surpluses and for determining the scope for local manufacturing and services. High transportation costs prevent sales of all but very high-value crops, thus limiting the scope for agricultural activities. At the same time limited access to urban markets also implies that goods and services are produced locally, increasing local non-farm employment opportunities if local demand suffices. The importance of transport costs is depicted in Figure 1, presenting a stylized representation of the development of rural non-farm employment opportunities in relation to transport costs and agricultural growth. Agricultural and non-agricultural sectors are linked through production and expenditure linkages. These links imply that growth (or lack of growth) from one sector can spill over to (or inhibit) another sector (FAO 2002). The importance of transport costs implies that the four stages ((1) traditional; (2) locally linked; (3) leakage to urban areas; (4) new urban links) are only relevant for the countryside in between the pre-urban and remote areas. Local non-farm production in pre-urban areas typically needs to compete with the nearby urban production, only leaving room for complementary production. Local non-farm production in the remote areas, on the other hand, usually be protected from urban competition by high transport costs. In reality developments vary across regions and sectors. Recession and disasters may result in a decline in agriculture, leading through negative spill-over effects to a contraction of the non-farm sector. There is thus by no means a homogeneous and linear process that irreversibly leads to the development of rural non-farm employment.

2.7 Empirical Literature Reviews

Most of the empirical evidences on the determinants income source diversifications and to assess the role of non-farm activities in sustaining the rural livelihood of have been carried out in different countries. Longman Rashid pours (2011) a study on the role of non-farm activities on rural sustainable development in West Azerbaijan Province of Iran: The study was investigate the original field survey with data from about 60 experts of rural development from three different organizations. This study was a descriptive correlation research and a combination of data gathering techniques. The study found that these activities have economic, social and environmental effect which explained while 68.40% variance at saving rural sustainable development in west Azerbaijan province and the economic effects are important as first priority. Finally, the study found that putting into consideration the limited capability of agricultural sector, it is necessary to provide infrastructure, legislation, incentives and training for Non-farm business. Importance of Non-agricultural employment includes employment for the rural poor groups, increased income, women's participation in economic activities, increase skills, prevent migration, mutual development of agriculture, the rural economy is stabilized, provides assistance to rural community sustainability.

Marijke Kuiper, Gardien Meijerink and Derek Eaton (2006), study on the Rural Livelihoods: Interplay Between Farm Activities, Non-farm Activities and the Resource Base Gold Coast, Australia,. The objective of this study is to analyze the role of non-farm activities in rural households' livelihood. The data were all collected using the methodology for surveying farm households and intensive monitoring of farm activities (involving frequent visits by enumerators) over one or more calendar years. This resulted in a rich dataset of 449 households (including data on 3305 individuals) that is consistent across households and countries. The findings suggest that farms closer to urban areas, but not in the new urban links or pre -urban zones around cities, are not investing more in agricultural production than those further away. In particular, increased incomes from non-farm employment opportunities are not being invested directly in farm production (at least not in improving crop production). This suggests that income earned with non-farm activities is not used to substitute for the labor withdrawn from agriculture. Although conclude that non-farm employment is important for rural households it can however not be taken for granted that non-farm employment provides a path out of poverty. Besides commonly analyzed factors like education and gender differences, distance from urban centers plays a key

role in determining access to non-farm employment. This limits the scope for using local non-farm employment for poverty reduction in remote areas, suggesting possibly a focus on migratory employment. In terms of sustainability of agricultural production we find that non-farm income may worsen soil nutrient mining in Africa.

According to Ye Wang, Chenggang Wang and Suwen Pan (2011), study on the impact of nonfarm Activities on Agricultural Productivity in Rural China. Rural non-farm activities are an important driving force for sustained income growth and economic development in the rural world. The data is a panel data derived from a nationwide village-level survey conducted by the Research Center for Rural Economy at China's Ministry of Agriculture. The panel includes more than 300 villages across all 31 provinces of China for years 2004, 2005, and 2006. The RCRE Survey Offices across China coordinated the survey. Descriptive statistics of the key variables used in the analysis. The SUR model is used to account for correlations. Regressions show that crop price's effects on labor and capital demands are not significant and its effect on agricultural land productivity is significant and positive and the regression shows that non-farm income has a significant positive effect on agricultural capital investment and the results show that non-farm revenue's effect on private agricultural capital stock is insignificant, but its effect on agricultural collective capital stock is positive and significant at the 1% level.

2.7.1 Ethiopian case: Empirical literature reviews

Research on rural livelihood diversification in Ethiopia rural structural transformation relating diversification out of agriculture is also increasingly becoming both policy and research issue in Ethiopia.:-According to Woinishet Asnake (2010), study on Participation into off-farm activities in rural Ethiopia: who earns more? This study basically 2004 and 2008 surveys respectively involving 1597 and 1574 households. Of these, 254 households that were in the survey in 2004 dropped out in 2008 and 231 households were new entrants during 2008 survey. Hence, total sample sizes of 1343 households have been used to create a balanced data for econometric analysis. This study examines Participation into off-farm activities and income among 1343 households in rural Ethiopia by using an original panel data set. The survey was made based on qualitative and quantitative fieldwork, secondary sources, and interviews with key informants in each survey area and community level questionnaires (Sepahvand 2009). The data, therefore, covered villages in almost all direction of the rural part of Ethiopia. However, pastoral areas were

not included in the survey (due to their constant mobility and difficulty of accessing them), hence cannot be considered as fully representative of the entire by using OLS linear fixed and random effect models. The key findings are as follows. (a) 'Non-poor' households generate a significant amount of income from farming activities. (b) Non-poor participate more in high-earning off-farm activities while, on average, 'poor' participate in low-earning off-farm activity. (c) Poor household participate due to push factor while non-poor participate as a choice. (d) Household with more resources are getting better off-farm earnings.(e) Share of off-farm income is higher for poor households, that is, off-farm income constitutes nearly 35% and 18% of household income for poor and non-poor households respectively (in 2008). The studies conclude that poorer households rely more on income generated from off-farm activities and they are benefited a lot from it than non-poor households. However, the aim is that off-farm activities to contribute more than merely absorbing the poor into lower earning activity.

Meaza Tadesse (2014), studies on the role of non-farm activities in sustaining the rural livelihood, (in the case of Enderta woreda Tigray regional state. The objective of this study to assess the role of non-farm activities in sustaining the livelihood of households in Enderta Woreda Activities in sustaining the rural livelihood of the people by using cross-sectional data collected from 190 sample households of five Tabias of Enderta woreda by using probability sampling. For the data analysis purpose; descriptive statistics including mean, frequency and percentages were used to describe the livelihood resources/assets of Enderta woreda, the role of non-farm activities in sustaining the rural livelihood. It was identified and analyzed the key constraints and opportunities as well as the contribution of nonfarm activities existing in the study area. The study relied on both primary and secondary sources that included both qualitative and quantitative types of data to generate relevant and valuable information from 190 households by using Kothari's formula. Data has been collected from the sample group through questionnaire; key in formats interview, and focus group discussion. Analyzed using the statistical package for social science (SPSS), then having analyzed the data the significant part of the result was based on descriptive statistics methods such as frequency, averages and percentages used to summarize and present the data. On the basis of the findings It was identified and analyzed the key constraints and opportunities as well as the contribution of nonfarm activities existing in the study *area*, include such as cobblestone production , Masonry & Painting, Sand & stone quarrying, Petty trade, preparation of food and local drink "Tela". Risk may attract people to diversify income; as farm opportunities are often limited, there by the farm households are motivated to diversify in to non-farm activities.

As of the case, unemployed and landless youths in rural *Tabias* in the study area are the ones who are engaged in the cobble stone production.

The research done by Fikru Tesfaye (2008) study on a case study of nonfarm rural livelihood diversification in Lume Woreda, Oromiya regional state. The overall objective of this research is to undertake an intensive case study on rural nonfarm diversification of communities in Lume Woreda, located in East Shoa Zone, Oromiya Region. To achieve this objective qualitative and quantitative data type used. The study relied on both primary and secondary sources. Logistic Regression models are used. The analysis was conducted using statistical procedures: Frequency distributions, Cross tabulations, Regression analysis (linear and logistic). It was then transferred (exported) to SPSS easily for further statistical and Econometric analysis. Using stratified data collection method the sample of using cross-sectional data collected from 200 households represents the full range of livelihood circumstances found in the study sites. The findings are the linear and logistic regression models run on the survey data have demonstrated that household education and age have positive and significant influence on diversification. Land holding of the family is negatively associated with diversification at a significant level. The result with respect to farm income is ambiguous. In the linear regression model, farm income is positively associated with non-farm income at a significant level, whereas in the logistic model no association is found between farm income and diversification. Diversification, measured by share of non-farm income in total income, is, however, positively associated with total income.

Brhanu Tsegaye (2016), conducted on Rural Non-farm livelihood diversification among farming households in Saharti Samre Woreda, Southeastern Tigray. The main objective of this study is to assess the rural nonfarm livelihood diversification among farming households in Saharti Samre Woreda, South Eastern Tigray. To achieve this objective used qualitative and quantitative data type used. The research is a cross-sectional study. The study employed primary and secondary data sources to achieve its core objectives. Structured questionnaire were developed and administered to a sample of 180 households from the two sampled *Tabias*, and data has been collected from the selected sample households. Methods of Data Processing and Analysis analyze cause-effect relationships of variables. A software package, Statistical Package for Social Sciences (SPSS) version 21, was used as a tool to analyze quantitative information gathered through the survey. The analysis was done using descriptive statistical analysis i.e. frequency distributions, percentages. In addition, a non-parametric statistical analysis, Chi- square, was used in order to analyze the relationship between and the dependent and independent variables that

were identified in the conceptual framework. The study concludes that, households' accessing financial credit is found statistically insignificant in influencing households' engagement on non-farm livelihood activities in both study areas –Tabia Addis Alem (weynadega) and Lemlem Arena (qola). Accessing financial credit is found not important in forcing or motivating farming households to be engaged on non-farm livelihood activities in this study area the major constraints of non-farm livelihood diversification identified by the survey households are lack of organized livelihood generating enterprises, skill deficiency and lack of financial capital. Among the above major constraints, lack of organized livelihood generating enterprises is commonly detected by majority of the survey households in both AddisAlem (weynadega)and Lemlem Arena (Qola) Tabias. In addition, absence of credit sources for the purpose of non-farm livelihood diversification, and lack of awareness about credit sources and fear of loss of farm land are among the constraints that inhibit farming households from diversifying their livelihoods to the non-farm sector.

Mohammed Seraje (2007), conducted on Livelihood strategies and their implications for rural-urban linkages: The case of Wolen komi town and the surrounding rural Kebeles. The paper examines the ways in which different households rely on varying combinations of activities, the factors affecting each strategy *and* their implications for rural-urban linkages. The data used in this study are both qualitative and quantitative, and were collected in January and February 2005. The data were analyzed using summary statistics, including frequency and cross-tabulation. In addition, qualitative analysis was performed to add further insight into livelihood strategies and their implications for the nature of rural-urban linkages. The Findings that the nature of rural-urban linkages depends on the size of credit, the place where credit is obtained from and the strength of social capital to undertake agriculture, non-farm activities and migration. The nature of rural-urban linkages depends on the size of capital, the place where credit is sourced insignificant numbers of rich town business owners seek credit from banks. The level of diversification into urban agriculture is negligible but there are significant numbers of town dwellers that commute to produce crops on rented land in rural areas.

A study conducted by Tassew's (2000) the study on the basis of farm household survey data collected from Tigray, shows that off farm income can be complementary to farm income if farm households are constrained in their borrowing. It also shows that farm households with more diversified sources of income have a higher agricultural productivity. One of the key findings of the study is that expenditure on farm input is dependent not only on agricultural production, but

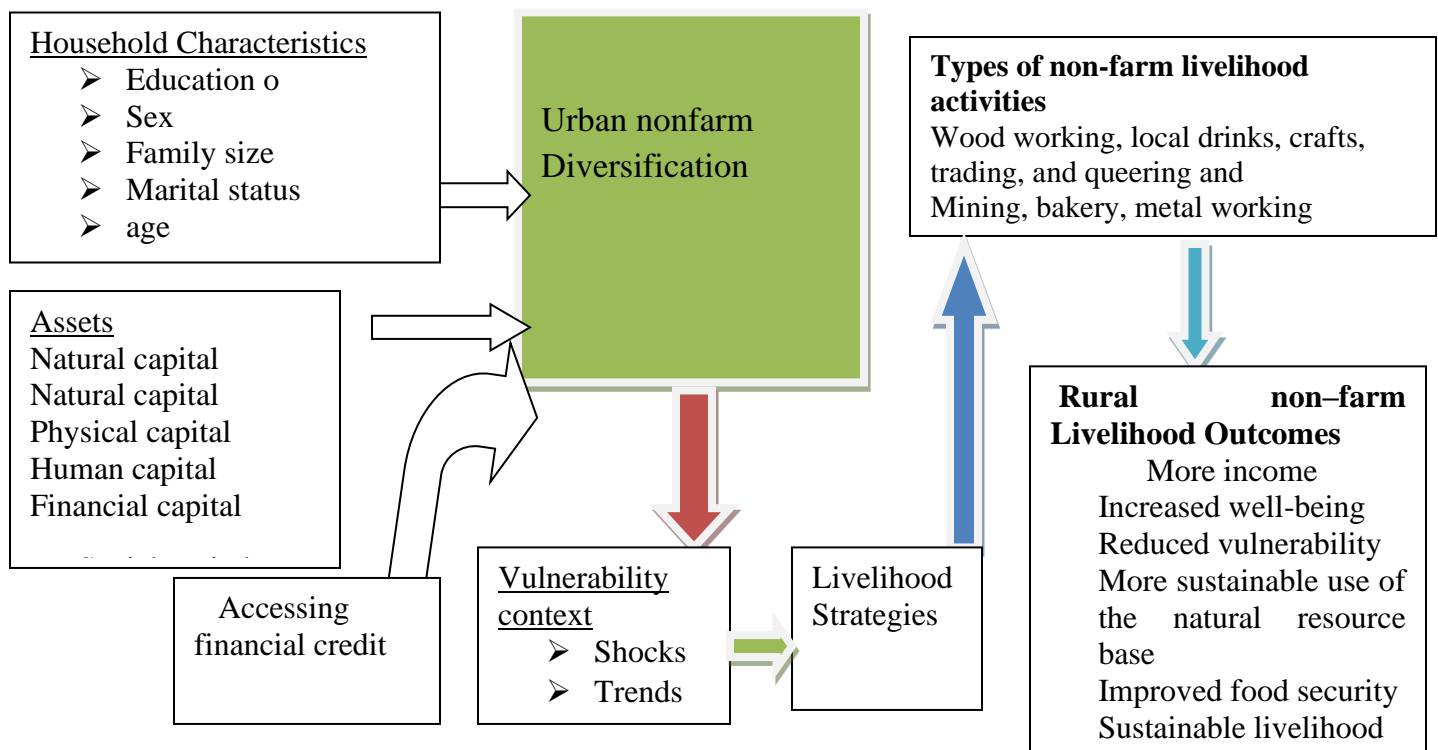
also on off-farm income because of capital market imperfections (borrowing constraints). Farmers involved in better paying off-farm activities such as masonry, carpentry and trading are in a better position to hire farm lab ours. In the study area a substantial proportion of farm households (81%) have diversified their income into off-farm activities.

2.8 The Conceptual Framework

Analyzing livelihood behaviors of rural households and the underlying causes of their behavior is a discouraging task. A framework is needed to break the complex human behavior in to its constituent parts so that the human mind can effectively and systematically deal with it; it is the analytical framework that guides the investigation, which should determine the nature of data required, and the methods of acquiring the necessary data. An analytical framework also serves as a “lens” through which a researcher looks in to and interprets behavior (Tesfaye, 2003). Recent academic and policy debates concerned with poverty reduction reflect a growing awareness of the value of the livelihoods concept in understanding how the poor call upon a range of different assets and activities as they seek to sustain and improve their wellbeing (Ellis, 2000).

Carney (1998: 8, quoted in Gordon and Craig, 2001) stresses the important factors to consider in analysis of livelihoods: ‘There is a need to understand the vulnerability context in which assets exist (the trends, shocks and local cultural practices which affect livelihoods). Second, it is vital to understand the structures and processes (policies, laws, rules of the game and incentives) which define people’s livelihood options.’

Figure 1: The Conceptual Framework



Source: from different literature and researchers Own formulation.

2.8.1 Urban non-farm livelihood for sustaining diversification framework

As it is shown above, Figure represents the framework, Urban non-farm activities for sustainable livelihoods regards, household characteristics (being male or female headed), Accessing financial credit, Assets, Livelihood Strategies, vulnerability contexts takes place in the urban households as fundamental to understanding their decision to diversify their livelihoods into non-farm activities. Sustainable Livelihood framework (SLF) has emerged as an alternative way of conceptualizing poverty alleviation, including its context, objectives and priorities. It focuses on one of the most fundamental aspects of life: the ability of people to support themselves, both now and into the future. The Framework is set in Figure, and presents the key aspects of Sustainable Livelihood Framework (SLF); the framework regards the asset of households as fundamental to understanding the options open to them, including participations in non-farm activities. The arrows in figure show the direction of influence from each aspect. The context of vulnerability has a significant effect on the nature of activities a household pursues. It includes shocks (sudden onset of natural disasters, conflicts, economic traumas, health problems and crop or livestock distress), trends (in population, resources, health problems, the economy or governance) and seasonality (cyclic fluctuations in prices, production, and employment). The context in which the household operates has important role in the nature of activities a household follow.

2.8.2 Conceptual definition of terms and explanation of the frame work

Livelihood: is a concept, which has different meaning for different people. However, for the purpose of this study, the early and widely cited work of Chambers and Conway (1992) definition of livelihood is used. A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: (Chambers and Conway, 1992:7-8).

Diversification: in this study, diversification is an attempt by individuals to find new ways to raise incomes and to reduce risk, by involving into activities in addition to main agricultural activity Hussein & Nelson (1998).

Rural livelihood diversification: is then defined as ‘the process by which households construct a diverse portfolio of activities and social support capabilities for survival and in order to improve their standard of living’ Ellis (1998).

Rural non-farm livelihood diversification: is the process of creation or engagement on ongoing social and economic processes by rural households other than the agricultural sector to increase portfolios of livelihood strategies.

Non-farm income: nonfarm income in this study is to mean income earned by households from livelihood activities only from the non-farm sector.

On-farm income: on-farm income in this study refers to the income might earn by household if the price of all annually produced crops value is converted in to birr and hull sell in the same year market price.

Vulnerability Context: Vulnerability context refers to seasonality, trends, and shocks that affect people's livelihood. The key attribute of these factors is that they are not susceptible to control by local people themselves, at least in the short and medium term (DFID, 2000).

Livelihood Resources (Assets): Livelihood assets are the resources on which people draw in order to carry out their livelihood strategies (Farrington et al., 2002). The members of a household combine their capabilities, skills and knowledge with the different resources at their disposal to create activities that enable them to achieve the best possible livelihood for themselves. Everything that goes towards creating that livelihood can be thought of as a livelihood asset (Messer and Townsley, 2003).The livelihood approach respects the asset status of households as important to understanding the choices open to them, containing diversification into non-farm activities. The asset location of a household has a significant effect on household participation in non-farm activities. The major livelihood assets are;

Human capital: like age, education, gender, health status, household size, dependency ratio and leadership potential, etc. (Bezemer and Lerman, 2003; Farrington *et al.*, 2002; Kollmair and Gamper, 2002);

Physical capital: comprises the basic infrastructure and producer goods needed to support livelihoods, such as reasonable transport, sheltered and housings, sufficient water supply and sanitation, reasonably priced energy and access to information (DFID, 1999); which refers to networks and connectedness, Kollmair and Gampe ,(2002) asserts that in the context of the SLA it is the social resources up on which people draw in search of their livelihood outcome such as networks that add to peoples trust and ability to cooperate or participate in a membership of more formalized groups and their arrangements of rules, norms and sanctions.

Financial capital: like savings, credit, and remittances from family members working outside the home (CARE, 2001; Bezemer and Lerman, 2003);

Natural capital: This is the natural resource stock from which resource and service flow, for instance, good air and water quality and foundation for good health and other features of a livelihood (Kollmair&Gamper, 2002).

Livelihood strategies: According to DFID (1999) the term livelihood strategies are defined *as* the range and combination of activities and choices that people make in order to achieve their livelihood goals, including productive activities, investment strategies, reproductive choices, etc. Livelihood strategies are composed of activities that generate the means of household survival and are the planned activities that men and women undertake to build their livelihoods (Ellis, 2000).

Livelihood outcomes: Livelihood outcomes are the achievements of livelihood strategies, such as more income (e.g. cash), increased well-being (e.g. non material goods, like self-esteem, health status, access to services, sense of inclusion), and reduced vulnerability (e.g. better resilience through increase in asset status), improved food security (e.g. increase in financial capital in order to buy food) and a more sustainable use of natural resources (e.g. appropriate property rights) (Scoones, 1998)

Accessing financial credit: Refers to the situation whether farming households have accessed credit or not

Household characteristics:-Household characteristics is to mean that whether a given household is male or female headed

CHAPTER THREE

3. Methodology of the Study

3.1 Description of the study area

Abiy-Addi is a town in northern Ethiopia. It is located about 1030 kilometers north of Addis Ababa and 96 kilometers southwest of Mekelle in the central zone of the Tigray region. The town has a Latitude of 13.5608(13°33`38.880" N) longitude of 38.9739 (38°58`26.040" E) in decimal degrees or DMS (Degrees, minutes, seconds). It is located at an elevation of 1,693 meters above sea level. The annual rainfall and annual temperature of Abiy-Addi town are 500- 800 mm and 17 to 25 degrees Celsius, respectively, which make human settlement comfortable. The town was established 150 years. Even though the town is old enough, its development is not as satisfactory as compared to its age. Abiy- Addi is the administrative center of both the town as well as Kola Temben Woreda. It is the principal place of Tembien, surrounded by four Woreda as and is a large market town. Based on the 2007 national census conducted by the Central Statistical Agency of Ethiopia (CSA, 2007), this woreda has a total population of 29896, of whom 14,590 are men and women, 15,306 respectively, and the woreda has an area of 2000.52 square kilometers. The majority of the inhabitants practice Ethiopian Orthodox Christianity and the Muslim Religion. The population speaks Tigrigna language (Source, Abiy-Addi office of plan and finance, 2012).

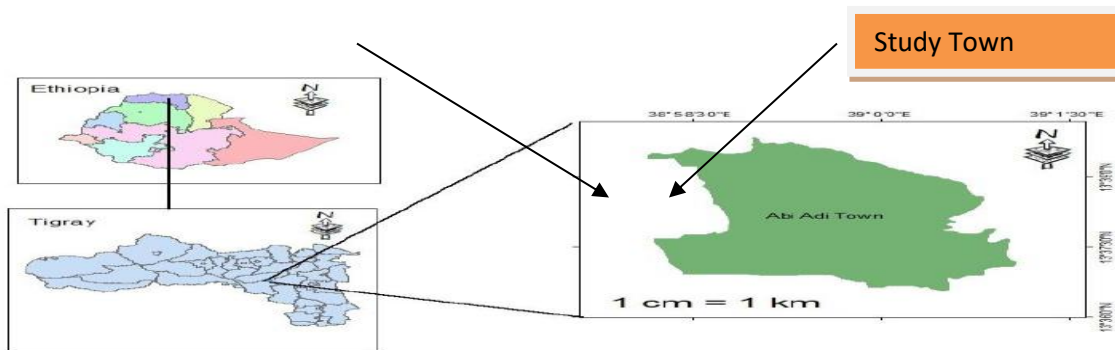


Figure 1: Location of study area (Abiy Addi Town) in Tigray National Regional State

3.2 The target population

The target population in this study was the people living in the urban town of Abiy-Addi, which consists of 4 Kebelles. The total population of households held these kebeles is 01 kebele, 1241 households (610 male and 631 female), 02kebele, 245 households (1205male and 1210female),

03kebele2615household (1231male and 1383 female), and 04 kebele, 182 households (148male and 34 female). And total of 6453households of the population in Abbiy-Addi town.

3.3 Research design and approaches

The research design for this study was a cross-sectional survey design. This research design is selected because most of the primary data to be used for this research is one-time socioeconomic data (data of a specific point in time) to be collected from an adequate sample size. A mixed research approach was used in this research. As indicated in Powell et al. (2008), quantitative and qualitative phases occurred at approximately the same point in time, with the quantitative phase being given higher priority, and mixing occurring within or across the data collection, analysis, and interpretation stage is used in this research.

3.4 Sample Size and Method of Sampling

The multistage sampling technique has been used. First, purposive sampling technique was employed to select Abiy-Addy town due to the high intensity of the income sources of households. Second, a random sampling technique was employed to select four kebelles, namely 01 kebele, 02 kebele, 03 keblles, and 04 kebele, based on the high intensity of the households engagement in the different income sources. Third, a simple random sampling technique was employed to select the sample households in order to give equal chance of being included in the entire survey. Finally, proportional random sampling technique was employed to allocate the sample size on the sampled Kebelles.

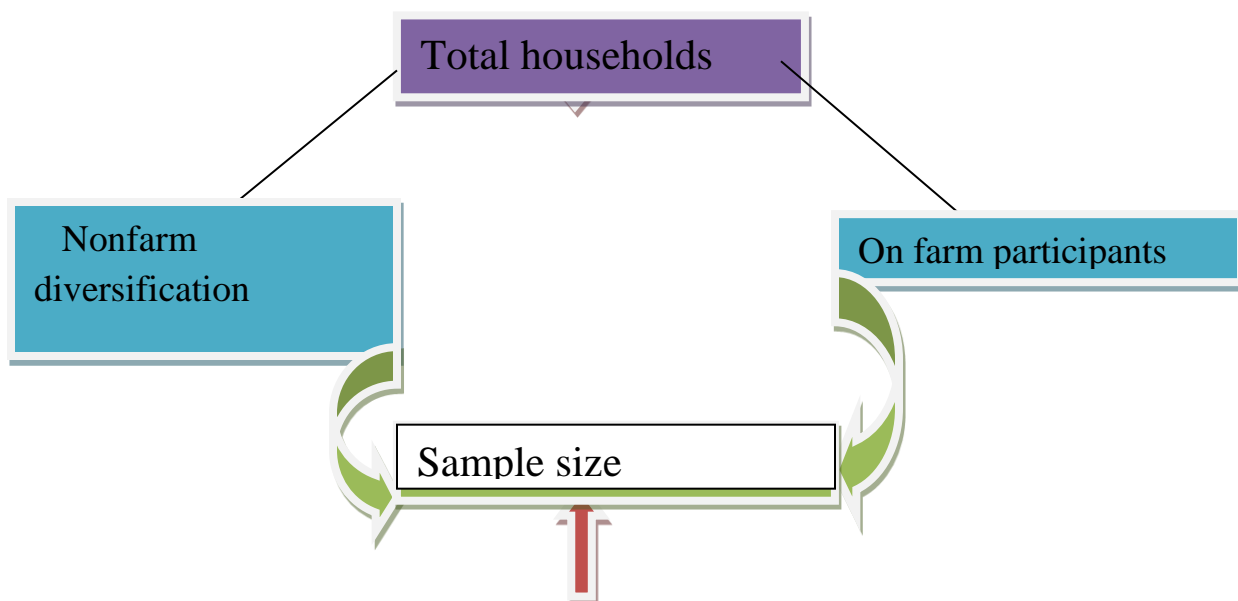


Figure 2: Sampling method

Table 1: Households distribution by Kebele

No	Name of Kebelles	No. of households
1	01 kebele	1241
2	02 kebele	2415
3	03 keblle	2615
4	04keblle	182
Total		6453

Source: Abiy-Addi office of Plan and Finance, 2023.

The total number of households in Abbiy-Addi town in the four kebelles is 6453. The appropriate sample size for this study was computed to be 376. There are several methods for determining the sample size of households from a finite population. But, for this study, the formula developed by Yamane's (1967) was used as follows:

$$n = \frac{N}{1 + N(e^2)} \text{Equation 1}$$

Where; n = is the sample size, N= is the population size =6453; e= is the level of precision (Sampling error) = 5% or 0.05

$$n = \frac{6453}{1 + 6453(0.05)^2} = \frac{7856453}{17.13} \approx 376 \text{ then } \underline{n=376}$$

- The sample size allocated to the four Kebelles is given as follows:

$$1. \text{ Sample size for 01 kebele} = \frac{376 \cdot 1241}{6453} = 72$$

$$2. \text{ Sample size for 02 kebele} = \frac{376 \cdot 2415}{6453} = 141$$

$$3. \text{ Sample size for 03 kebele} = \frac{376 \cdot 2615}{6453} = 152$$

$$4. \text{ Sample size for 04 kebele} = \frac{376 \cdot 182}{7856453} = 11$$

Therefore, the total sample size calculated for the entire study is 376 sample households.

3.5 Data type, sources and method of data collection

Data collection was the process of gathering and measuring information on variables of interest in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes (Dodge, 2003). Information pertaining to households, institutional situations, and farm and nonfarm activities other related issues, could be obtained directly through the structured questionnaire, which was conducted at the household level. The data type used was a cross-sectional household survey data. To address the objective, both primary, and secondary data sources were used. The primary data was collected using the structured and semi structured questionnaires. The secondary data was obtained from Abi Addi Agriculture Office, Central Statistics Agency, internet, from published researches, FAO, and other relevant organizations.

3.6 Method of Data Analysis

To analyze the data, both descriptive statistics and econometrics model were used. To address the descriptive statistics results, the measures of the central tendency, and tables were used. The econometric model used to address the determinants of the income sources diversification were the Poisson regression due to the count data nature of the income sources of the households considered as a dependent variable. Next, the contribution of the income source diversification was addressed using the Propensity Score Matching (PSM).

To achieve the last objective of the study, Propensity score matching (PSM) model was be used. In statistics; count data is a statistical data type, a type of data in which the observations can take only the non-negative integer values (0, 1, 2, 3, ---), and where these integers arise from counting rather than ran kinking.

3.6.1. Econometric Model Specifications

Counts are non-negative integers. They represent the number of occurrences of an event with in fixed period. The count data model has a dependent variable that is count (0, 1, 2, 3 and soon). Most of the data are concentrated on a few small discrete values. The model contains both quantitative and Qualitative variables to identify the major determinants of non-farm diversifications. The count model is econometrically specified as follows:

Given the model count data as a function of covariates, X, the Poisson regression is applicable with a mean value of λ - as a function of covariates. Therefore, the Poisson regression model is formulated as follows:

Suppose events are occurring randomly and uniformly in time. The events occur with a known average. Let X be the number of events occurring (arrivals) in a fixed period of time (time interval of given length). X = number of non-farm diversifications. Then, X have a Poisson distribution with parameter λ

$$P(X) = \frac{\lambda^x e^{-\lambda}}{x!}, \quad X= 1, 2, 3 \dots$$

The intensity parameter, λ , represents the expected number of occurrences in a fixed period of time –i.e., $\lambda=E[X]$. It is also the variance of the count: $\lambda= \text{Var}[X] \Rightarrow \lambda>0$.

3.4 Variables Specification

The analysis that follows in the study area on non-farm diversification uses count models to identify non-farm activities and Propensity score matching (PSM) to estimate the impact of non-farm diversification. The following relationship is therefore investigated using these models:

Non-farm Income diversification = f (education of household, sex household, marital status of household, Size of household, age of household head, accessing financial credit, kebele).

Dependent variable

Non-farm income diversification: - in this study is to mean income earned by households from livelihood activities both activities.

Independent variables

Education:-is a dummy variable indicating if a household head participated at least in primary education or not.

Sex: -sex is a dummy variable .The sex of the household head is meant gender-based participation of differentiation in non-farm diversification rural livelihood activities and earnings of non-farm income.

Age of household head:- it is controlled to see the effect of experience of a household on participation decision and amount of earning. It is expected that initially an increase in experience increase both probability of participation and amount of earning and the effect of experience expected to reduce after some maximum point.

Marital status of household: - households headed are single, married, divorced or widow.

Access to credit services: - the situation whether farming households have accessed credit or not.

Family size:– The number of people’s lives in one house.

Hypothesis the constraints of nonfarm activities/diversification

Education:-education of the household head is expected to increase the productivity of the nonfarm activities. They have positively related, when education of the household head increase diversification of non-farm income increase.

Age:-The age of the household is expected to negatively influence non-farm livelihood diversification .when age of the house hold old diversification of nonfarm is low.

Accessing financial credit:- the situation whether farming households has accessed credit or no. They have positively relationship .when there is credit access there is highly working capital.

Sex and Marital status of head:- It is expected that participation decision and amount of earning depend on sex of individual especially amount of earning expected to be high for male headed households due to a difference in wage rate among male and female workers in most developing countries. It has negative relation to off farm income

Essentiality of nonfarm:-it expected to participation on nonfarm or diversification is more essential and efficient to sustain urban livelihood.

Table 3.2: Description of dependent & independent variables used in the model

Variables	Description of the variable	Type	Measurement value
Dependent variable	Nonfarm income diversification	Continuous	Count data values (1, 2, 3,...)
	Income (as a measure of livelihood)	Continuous	In birr
Independent variables	Education of household	Continuous	In years of schooling
	Age of house holds	Continuous	In years old
	Family size of house holds	Continuous	Number of active and dependent members
	Marital status	Categorical	single=0 and married=1 2 = divorced, 3 = widowed 4=separated
	Sex	Dummy	male=1 and female=0
	Kebelle	Categorical	01keblle=1,02keblle=2,03keblle=3,04keblle=4
	Credit access	Dummy	yes=1, no=0
	Nonfarm essentiality	Dummy	yes=1, no=0
	Training	Dummy	yes=1, no=0
	Remittance income, rental income, poultry income	Continuous	Measured in birr

Source: Own Computation, 2025

CHAPTER FOUR

4. Results and Discussion

4.1. Descriptive statistics analysis

Table 4.1: Summary of Descriptive Statistics for Continuous Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	376	46.875	8.634	27	68
Family size	376	5.471	2.058	1	15
Education	376	2.686	2.489	0	10
Distance home	376	1.142	.549	.02	3.5
Distance market km	376	1.347	.631	0	5
Income	376	64410.372	66588.629	12500	850000
Nonfarmincome	376	54045.585	85231.886	0	800000
Rentalincome	376	20223.67	31316.699	0	150000
Poultryincome	376	8405.16	20827.345	0	128000
Casuallaborincome	376	3043.152	4345.687	0	52000
Count (income sources)	376	4.473	.955	0	6
Total income	376	236493.55	225028.98	.157	2010000

Source: Own Survey, 2025

Table 4.1 presents summary statistics for key continuous variables used in analyzing income source diversification among households in Abi Addi Town. The average age of households was 46.9 years, with a minimum of 27 and a maximum of 68, suggesting that most participants were within the productive age range. This age group is typically active in exploring multiple income sources and adapting to changing livelihood strategies. Similar age distributions were observed in studies by Alemu and Adane (2020) and Kassie et al. (2011), who found that middle-aged farmers are more likely to diversify income sources due to economic responsibility and experience. The average family size was 5.47 members, which reflects a moderate household size typical of urban households in Ethiopia. Larger families often have more labor available for different livelihood activities. This finding is consistent with Challa and Tilahun (2014), who noted that family size positively influences diversification by providing labor flexibility across different income-generating sectors.

The average education level (2.69 years of schooling) suggests low formal education attainment, though even limited literacy can enhance adoption of new income-generating methods (Asfaw & Admassie, 2004).

Regarding access and infrastructure, the average distance from home to the farm (1.14 km) and distance to market (1.35 km) indicate that households have good proximity to markets and production sites, which facilitates participation in both agricultural and non-farm income sources.

These findings are consistent with Alemu et al. (2017), who found that shorter market distances enhance diversification due to reduced transaction costs.

The mean household income was approximately 64,410 Birr, with significant variation (SD = 66,588), suggesting income inequality among households. Non-farm income (mean = 54,046 Birr) accounted for a substantial share, highlighting the growing importance of non-farm activities in urban livelihoods. Similarly, studies by Ellis (2000) and Woldehanna (2000) show that non-farm income is a major source of resilience and livelihood security in urban and peri-urban areas of Ethiopia.

The count variable (mean = 4.47) represents the average number of income-generating activities per household, indicating a high level of income diversification, which aligns with the study's focus on livelihood strategies in an urban context.

The section below provides a detailed descriptive analysis of key categorical variables related to urban household livelihoods in Abiy Addi town. The variables include Kebele, Gender, Marital Status, Access to Credit, Off-farm Participation, Extension Service, and Training. These indicators reflect demographic, socioeconomic, and institutional attributes that influence income source diversification among households.

Table 4.2: Summary of Descriptive Statistics for Dummy Variables

Variable	Category	Frequency
Kebele	kebele 3	152
	Kebele 2	139
	kebele 1	73
	kebele 4	12
Gender	Male	198
	Female	178
Marital_status	Married	275
	Single	56
	Divorced	29
	Widowed	15
Accesscredit	Separated	1
	No	193
Offfarm_participation	Yes	183
	No	273
Extension_service	Yes	103
	No	209
Training	Yes	167
	No	201
	No	175

Source: Own Survey, 2025

The descriptive statistics reveal important insights into the demographic and socioeconomic characteristics of the urban households surveyed in Abiy Addi town: Most households reside in Kebele 3 (152 households, 38.7%), followed by Kebele 2 (139 households, 35.4%), Kebele 1 (73 households, 18.6%), and Kebele 4 (12 households, 3%). This distribution indicates the dominance of Kebele 3 and 2 in the study area’s urban agricultural activities. Males constitute 198 (52.6%) of households, while females account for 178 (47.4%). This shows near gender balance, but men slightly dominate household heads in urban agricultural engagement. A significant majority (275, or 72.9%) are married, followed by single households (56, or 14.8%). The remaining responses likely correspond to other marital categories. Married households tend to have more stable income diversification strategies due to pooled resources and responsibilities. About 183 (48.6%) households reported access to credit, while 193 (51.4%) did not. The nearly equal distribution highlights limited financial inclusion, which may constrain investment in diversified income sources. A large proportion (273, or 72.6%) are involved in off-farm activities, suggesting that diversification beyond agriculture plays a crucial role in sustaining urban livelihoods. Around 209 (55.6%) households received extension services, while 167 (44.4%) did not. This shows that institutional support systems are moderately active, helping households adopt improved practices. A total of 201 (53.4%) households attended training related to agriculture or livelihood development, reflecting reasonable access to capacity-building opportunities. Overall, the findings indicate that gender balance, moderate institutional support, and substantial off-farm participation are key features shaping urban income diversification in Abiy Addi town.

Table 4.3. Households' sources of income as a means of livelihood engagements

Sources of HH income	Freq.	Percent	Cum.
Government	71	18.88	18.88
private	102	27.13	46.01
rent	203	53.99	100.00
Total	376	100.00	

Source: Own Survey, 2025

Table 4.3 presents the distribution of households by their main sources of income in Abi Addi Town. The results indicate that rental income (53.99%) is the predominant livelihood source, followed by private sector employment (27.13%), and government employment (18.88%).

This finding implies that a large share of households in the study area relies on non-agricultural income sources, particularly rental earnings from housing or commercial property. This trend reflects the ongoing urbanization and structural transformation in Ethiopian towns, where households increasingly shift from agriculture to non-farm income-generating activities. The

dominance of rental income also suggests that asset accumulation, particularly in the form of urban land and housing, has become a key livelihood strategy among residents.

Similar findings were reported by Asfaw et al. (2021) and Gebru and Beyene (2020), who found that urban households in Tigray and Amhara regions derive a significant portion of their income from rent, trade, and wage employment, illustrating a diversification away from traditional agricultural livelihoods. Ellis (2000) also noted that in urban settings, diversification into wage and rental activities is a sign of economic adaptation and resilience to income shocks.

The relatively smaller proportion of households employed in government (18.88%) and private sector jobs (27.13%) reflects the limited formal employment opportunities in small towns such as Abi Addi. This aligns with Woldehanna (2000), who found that informal and semi-formal sectors dominate the urban labor market in smaller Ethiopian towns. The overall pattern suggests that households in Abi Addi Town rely heavily on asset-based and non-farm livelihood strategies, which could serve as a cushion against food insecurity and economic instability.

Table 4.4: Households' Food Insecurity Status distribution by Household Food Insecurity Access Scales

	Freq.	Percent	Cum.
Food secure	139	36.97	36.97
Mildly food-insecure	108	28.72	65.69
Moderately food insecure	116	30.85	96.54
Severely food insecure	13	3.46	100.00
Total	376	100.00	

Source: Own Survey, 2025

Table 4.4 summarizes the food security situation of the sample households based on the Household Food Insecurity Access Scale (HFIAS), developed by the FAO and USAID (Coates et al., 2007). The results reveal that: 36.97% of households are food secure, 28.72% are mildly food insecure, 30.85% are moderately food insecure, and 3.46% are severely food insecure.

These results show that while over one-third of the households maintain an acceptable level of food security, a majority (63%) of the population faces varying degrees of food insecurity. This indicates that urban households in Abi Addi Town remain vulnerable to economic shocks, despite access to diversified income sources. The relatively low share of severely food-insecure households (3.46%) suggests that extreme hunger is not widespread; however, moderate food insecurity, characterized by reduced meal quality and quantity, is a significant concern. This finding mirrors those of Alemu and Adane (2020) and FAO (2019), who observed that urban food insecurity in Ethiopia is often linked to unstable non-farm income, rising food prices, and limited

access to affordable urban land for food production.

The results also align with Maxwell et al. (2014), who found that in urban areas, households may have access to diverse income sources but remain food insecure due to the high cost of living and market dependence for food. Furthermore, Tafer and Worku (2022) reported that in small Ethiopian towns, food insecurity is highly correlated with income instability and limited social safety nets.

Overall, these findings highlight that while income diversification in Abi Addi Town provides households with multiple revenue streams, it does not necessarily translate into improved food security. This implies that the quality and stability of income sources are as critical as the number of income sources in ensuring household food access.

Table 4.5: Marginal Effect Estimation after Poisson Regression of the Determinants of Income Source Diversification

variable	dy/dx	Std. err.	Z	P>z	[95% C.I.]	X
age	-0.014	0.007	-2.020	0.044**	-0.027 -0.000	46.875
Gender	-0.192	0.107	-1.790	0.073*	-0.401 0.018	0.473
maritalstatus	-0.087	0.106	-0.820	0.414	-0.294 0.121	1.016
education	-0.021	0.021	-0.990	0.323	-0.061 0.020	2.686
familysize	0.022	0.023	0.930	0.353	-0.024 0.067	5.471
Distancemarketkm	0.032	0.090	0.350	0.723	-0.145 0.209	1.142
Accesscredit	0.445	0.269	1.650	0.098*	-0.083 0.973	0.487
Offfarmparticipation	-0.103	0.161	-0.640	0.520	-0.418 0.212	0.726
extensionservice	0.091	0.099	0.920	0.358	-0.103 0.286	0.556
Training	-0.509	0.282	-1.800	0.072*	-1.062 0.045	0.535
Mean dependent var		4.473	SD dependent var		0.955	
Pseudo r-squared		0.002	Number of obs		376	
Chi-square		15.314	Prob > chi2		0.121	
Akaike crit. (AIC)		1364.704	Bayesian crit. (BIC)		1407.930	

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

*** $p < .01$, ** $p < .05$, * $p < .1$

Source: Own Survey

The Poisson regression model identifies the determinants of income source diversification (measured by the number of income sources). The mean predicted value (4.47) indicates that, on average, households participate in roughly four income-generating activities. Age had a negative and significant effect at the 5% level, indicating that older households are less likely to diversify their income sources. Younger individuals are more engaged in multiple livelihood activities due to greater physical ability and risk tolerance. This finding is in line with Matsumoto et al. (2013)

and Gebru and Beyene (2020), who found that younger farmers are more adaptive to new income opportunities. Gender showed a negative marginal effect, weakly significant at 10%. This implies that male-headed households are slightly less diversified compared to female-headed ones, possibly because urban women are more active in petty trade and food processing. This result supports Doss and Morris (2001) and Tadele and Gella (2012), who observed that women play a central role in income diversification through small-scale and home-based businesses.

Access to credit had a positive and weakly significant impact at the 10% level, suggesting that households with access to credit tend to diversify more. Credit facilitates investment in multiple activities such as trading, urban farming, or livestock production. This is consistent with Kassie et al. (2015) and Gebremariam et al. (2019), who emphasized the importance of credit availability in enabling households to overcome liquidity constraints and expand livelihood portfolios.

Training had a negative and significant effect, which is somewhat counterintuitive. It may indicate that households receiving specific vocational or technical training focus on a specialized income source rather than diversifying. This pattern aligns with Wolday (2007), who found that skill-specific training can encourage specialization rather than diversification, particularly in urban economies. Variables such as education, family size, marital status, distance to market, and extension service did not show statistically significant effects, though their signs are consistent with expectations. For instance, education was positive but insignificant, implying that basic literacy might not be enough to drive diversification unless accompanied by access to financial and market resources. Overall, the Poisson model's pseudo-R² (0.002) indicates that while individual socioeconomic factors explain part of the variation, income diversification is influenced by multiple overlapping economic, social, and institutional conditions.

Table 4.6: ATT Estimation of the Income Diversification of the Households

Matching algorithms	n.treated	n.control	ATT	Std.Err.	t
Nearest neighbour matching	340	14	-0.266	0.047	-5.621***
Kernel matching	340	20	-0.216	0.051	-4.232***
Radius matching	340	20	-0.213	0.048	-4.434***
Stratification matching	340	28	-0.211	0.060	-3.522***

***, refers to a 1% probability level of significance.

Source: Own Survey, 2025

The Propensity Score Matching (PSM) results in Table 4.6 estimate the impact of diversification on household outcomes. Across all four matching algorithms (Nearest Neighbour, Kernel, Radius, and Stratification), the Average Treatment Effect on the Treated (ATT) is negative and highly significant ($p < 0.01$).

This means that highly diversified households tend to have lower average income than less-diversified ones. This counterintuitive result may suggest that households diversify as a risk management strategy rather than as a pathway to higher earnings. In urban settings with limited capital, households often pursue multiple low-return activities (e.g., petty trade, daily labor) to stabilize income rather than increase wealth.

This result is consistent with Barrett et al. (2001) and Ellis (2000), who argued that diversification in low-income contexts is often “survival-driven,” not “accumulation-driven.” Similarly, Woldehanna (2000) found that diversification among Ethiopian households primarily aims to reduce vulnerability to income shocks, rather than to maximize profit. Thus, while income diversification enhances livelihood security and resilience, it may not necessarily lead to higher total income unless accompanied by productivity-enhancing factors like credit, skills, and infrastructure.

Table 4.7. Variance Inflation Factor of Continuous Variables

Variable	VIF	1/VIF
Poultryincome	1.52	.658
Rentalincome	1.446	.692
total income	1.409	.71
Nonfarmincome	1.248	.801
Distance market km	1.119	.894
INCOM	1.088	.919
Education	1.072	.933
Distance home	1.062	.941
Casuallaborincome	1.054	.949
farm experience	1.041	.961
family size	1.029	.972
Mean VIF	1.19	.

Source: Own Survey, 2025

The Variance Inflation Factor (VIF) results show an average VIF of 1.19, indicating that multicollinearity is not a problem among the continuous explanatory variables.

Table 4.8. Pairwise correlations of Dummy Variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) gender	1.000					
(2) marital_status	0.043	1.000				
(3) accesscredit	0.249	-0.365	1.000			
(4) offfarm_participation	-0.098	-0.516	0.598	1.000		
(5) extension_service	0.022	0.098	-0.179	-0.129	1.000	
(6) training	0.169	-0.377	0.909	0.658	-0.212	1.000

Source: Own Survey, 2025

Similarly, the pairwise correlation matrix (Table 4.8) reveals no strong correlation between dummy variables, confirming the statistical reliability of the regression estimates.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

The findings reveal that income diversification plays a critical role in improving the economic security of urban households. Participation in non-farm activities such as small-scale manufacturing, food processing, and construction significantly supplements household income and enhances resilience to economic shocks. Determinants such as education, access to credit, infrastructure, and training opportunities positively influence non-farm participation, while limited working premises and high loan interest rates hinder diversification. The study confirms that relying solely on farm income is insufficient for food security in urban areas, emphasizing the necessity of diversified livelihood strategies.

The estimated Average Treatment Effect on the Treated (ATT) showed a positive and statistically significant impact of diversification on household income and livelihood security. On average, households engaged in non-farm diversification earned approximately 54,046 Birr annually, compared to 23,649 Birr among non-participants, indicating that diversification nearly doubled annual income levels. The ATT results further revealed that diversified households were significantly more food secure and less vulnerable to income shocks.

In conclusion, the study confirms that income source diversification is a significant determinant of urban household welfare in Abiy-Addi Town. The Poisson model identified education, credit access, and training as positive drivers of participation, while the PSM analysis demonstrated that diversification substantially improves household income and livelihood stability. The results collectively highlight that promoting non-farm sectors — particularly small-scale manufacturing, agro-processing, and construction — is vital for enhancing urban economic resilience.

5.2. Recommendations

Based on the findings, the major recommendations are given as follows:

- ✚ Financial institutions should provide affordable loan schemes with lower interest rates to support small-scale urban enterprises. Investment in roads, water supply, and electricity is essential to stimulate non-farm sector growth.

- ✚ Capacity-building programs should focus on entrepreneurship, financial literacy, and technical skills. Support for agro-processing, textiles, and construction materials can generate employment and income diversification.
- ✚ Urban livelihood policies should mainstream non-farm sectors as part of poverty reduction and employment strategies. Urban income diversification should be supported through small-scale enterprise development, improved access to credit, and technical training to ensure that non-farm activities are productive and sustainable. Urban food security programs need to integrate livelihood strategies, particularly for low-income households relying on unstable or low-paying activities.
- ✚ Rental and informal sector regulation could help balance income distribution and ensure equitable access to livelihood opportunities.
- ✚ Policies promoting urban agriculture and microenterprise could help improve dietary access and reduce urban poverty.

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Appendices

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
age	376	46.875	8.634	27	68
family size	376	5.471	2.058	1	15
farm experince	376	13.024	6.092	2	35
education	376	2.686	2.489	0	10
Distance home	376	1.142	.549	.02	3.5

Distance market km	376	1.347	.631	0	5
INCOM	376	64410.372	66588.629	12500	850000
nonfarmincome	376	54045.585	85231.886	0	800000
rentalincome	376	20223.67	31316.699	0	150000
poultryincome	376	8405.16	20827.345	0	128000
casuallaborincome	376	3043.152	4345.687	0	52000
count	376	4.473	.955	0	6
total income	376	236493.55	225028.98	.157	2010000

Regression

Determinants of income source diversification – Poisson regression model used (count values)

Poisson regression

count	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
age	-.003	.002	-2.01	.044	-.006	0	**
gender	-.043	.024	-1.78	.075	-.09	.004	*
marital_staus	-.019	.024	-0.82	.414	-.066	.027	
education	-.005	.005	-0.99	.324	-.014	.005	
family_size	.005	.005	0.93	.353	-.005	.015	
Distance_home	.007	.02	0.35	.723	-.032	.047	
accesscredit	.099	.06	1.65	.098	-.018	.217	*
offfarm_participati on	-.023	.036	-0.65	.518	-.093	.047	
extension_service	.02	.022	0.92	.359	-.023	.064	
training	-.113	.063	-1.81	.071	-.236	.01	*
Constant	1.676	.082	20.43	0	1.515	1.837	***
Mean dependent var		4.473	SD dependent var			0.955	
Pseudo r-squared		0.002	Number of obs			376	
Chi-square		15.314	Prob > chi2			0.121	
Akaike crit. (AIC)		1364.704	Bayesian crit. (BIC)			1407.930	

*** $p < .01$, ** $p < .05$, * $p < .1$

Marginal effects after poisson

$$y = \text{Predicted number of events (predict)} \\ = 4.4691598$$

variable	dy/dx	Std.	err.	z	P>z	[95%	C.I.
age	-0.014	0.007	-2.020	0.044	-0.027	-0.000	46.875	
gender*	-0.192	0.107	-1.790	0.073	-0.401	0.018	0.473	
marita~s	-0.087	0.106	-0.820	0.414	-0.294	0.121	1.016	
educat~n	-0.021	0.021	-0.990	0.323	-0.061	0.020	2.686	
family~e	0.022	0.023	0.930	0.353	-0.024	0.067	5.471	
Distan~e	0.032	0.090	0.350	0.723	-0.145	0.209	1.142	
access~t*	0.445	0.269	1.650	0.098	-0.083	0.973	0.487	
offfarm~n*	-0.103	0.161	-0.640	0.520	-0.418	0.212	0.726	
extens~e*	0.091	0.099	0.920	0.358	-0.103	0.286	0.556	
training*	-0.509	0.282	-1.800	0.072	-1.062	0.045	0.535	

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

Algorithm to estimate the propensity score

The treatment is income_diversificationstatus

income_diversification

status	Freq.	Percent	Cum.
0	28	7.610	7.610
1	340	92.390	100.000
Total	368		100.000

Estimation of the propensity score
 Iteration 0: log likelihood = -99.031285
 Iteration 1: log likelihood = -77.778058
 Iteration 2: log likelihood = -62.155426
 Iteration 3: log likelihood = -60.618204
 Iteration 4: log likelihood = -60.528161
 Iteration 5: log likelihood = -60.527586
 Iteration 6: log likelihood = -60.527586

Logistic regression Number of obs = 368
 LR chi2(9) = 77.01
 Prob > chi2 = 0.0000
 Log likelihood = -60.527586 Pseudo R2 = 0.3888

income_div~s	Coefficient	Std.	err.	z	P>z	[95%	conf.	interval]
age	-0.000	0.039	-0.010	0.995	-0.076	0.076		
gender	0.591	0.531	1.110	0.265	-0.449	1.632		
marital_st~s	-0.298	0.430	-0.690	0.489	-1.141	0.545		
education	-0.018	0.104	-0.180	0.860	-0.222	0.185		
family_size	-0.038	0.193	-0.190	0.846	-0.417	0.342		
Distance_h~e	-0.642	0.589	-1.090	0.276	-1.797	0.513		
accesscredit	1.105	1.000	1.110	0.269	-0.855	3.065		
offfarm_par~n	2.616	0.833	3.140	0.002	0.984	4.248		
extension_~e	2.753	0.570	4.830	0.000	1.636	3.871		
_cons	1.082	2.113	0.510	0.608	-3.058	5.223		

Note: the common support option has been selected
 The region of common support is [.42472308, .9995519]
 Description of the estimated propensity score
 in region of common support

Estimated propensity score

Percentiles	Smallest	
1%	.4693822	.4247231
5%	.5906504	.4335232
10%	.8978868	.4606687
Obs	364	
25%	.9434226	.4693822
Sum of wgt.	364	
50%	.983745	Mean
	.9438998	
Largest	Std. dev.	.1110691
75%	.9968728	.9994847
90%	.998952	.9994978
Variance	.0123363	
95%	.9992406	.9995347
Skewness	-3.201377	
99%	.9994847	.9995519

Kurtosis 12.54286

Step 1: Identification of the optimal
number of blocks
Use option detail if you want more
detailed output

The final number of blocks is 5

This number of blocks ensures that
the mean propensity score
is not different for treated and
controls in each blocks

Step 2: Test of balancing property
of the propensity score
Use option detail if you want more
detailed output

Variable marital_staus is not
balanced in block 3

Try a different specification of the
propensity score

Inferior of block of pscore	0	income_diversificatio nstatus 1	Total
.4	9	12	21
.6	0	3	3
.8	7	325	332
Total	16	340	356

Note: the common support option
has been selected

End of the algorithm to estimate the
 pscore

Variance inflation factor

	VIF	1/VIF
poultryincome	1.52	.658
rentalincome	1.446	.692
total income	1.409	.71
nonfarmincome	1.248	.801
Distance market km	1.119	.894
INCOM	1.088	.919
education	1.072	.933
Distance home	1.062	.941
casuallaborincome	1.054	.949
farm experince	1.041	.961
family size	1.029	.972
Mean VIF	1.19	.

Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) gender	1.000					
(2) marital_staus	0.043	1.000				
(3) accesscredit	0.249	-0.365	1.000			
(4) offarm_partici~n	-0.098	-0.516	0.598	1.000		
(5) extension_serv~e	0.022	0.098	-0.179	-0.129	1.000	
(6) training	0.169	-0.377	0.909	0.658	-0.212	1.000

ATT estimation with the Radius Matching method
 Analytical standard errors

n. treat.	n. contr.	ATT	Std.Err.	t
340	20	-0.213	0.077	-2.785

Note: the numbers of treated and controls refer to actual matches within radius

Bootstrapping of standard errors

Command: attr hhi
 income_diversificationstatus age
 gender marital_staus education
 family_size Distance_home

```

accesscredit offfarm_participation
extension_service training , pscore(p)
logit comsup r
> adius(.16)
Statistic: attr = r(attr)

```

.....
.....

note: label truncated to 80
characters

Bootstrap statistics
Number of obs = 376
Replications = 100

Variable	Reps	Observed	Bias	Std.	err.	[95%	conf.	interval]
attr	100	-0.213	-0.007	0.048	-0.309	-0.118	(N)	
		-0.312		-0.116	(P)			
		-0.291		-0.081	(BC)			

Key: N: Normal
P: Percentile
BC: Bias-corrected

ATT estimation with the Radius
Matching method
Bootstrapped standard errors

n. treat.	n. contr.	ATT	Std. Err.	t
340	20	-0.213	0.048	-4.434

Note: the numbers of treated and controls refer to actual
matches within radius

ATT estimation with the Radius Matching method
Analytical standard errors

n. treat.	n. contr.	ATT	Std.Err.	t
340	20	-0.213	0.077	-2.785

Note: the numbers of treated and controls refer to actual
matches within radius

Bootstrapping of standard errors

Command: attr hhi income_diversificationstatus age gender marital_staus
 education family_size Distance_home accesscredit offarm_participation
 extension_service training , pscore(p) logit comsup r
 > adius(.16)
 Statistic: attr = r(attr)

.....
 note: label truncated to 80 characters

Bootstrap statistics Number of obs = 376
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		-0.312			(P)			
		-0.291			(BC)			

Key: N: Normal
 P: Percentile
 BC: Bias-corrected

ATT estimation with the Radius
 Matching method
 Bootstrapped standard errors

n. treat.	n. contr.	ATT	Std. Err.	t
340	20	-0.213	0.048	-4.434

 Note: the numbers of treated and controls refer to actual
 matches within radius

Questionnaire

University of Mekelle

College of Business and Economics

Department of Development Policy and Analysis.

Household Survey Questionnaires to be filled by sample household heads.

This questionnaire is prepared by a Development policy and Analysis. Post Graduate student in University of mekele for partial fulfillment of Master of Arts Degree in Development policy and Analysis. The aim of this questionnaire is to collect data

about “The Role of Nonfarm Activities in Sustaining the Urban Livelihood in Abiy-addi town”.The information you provide is pertinent for successfully accomplishing the research really thanking and appreciating your kind help in advance; and I want to say thank you!

General Instruction

1. Please put a tick mark (✓) and choose alternative word that appropriately represents your response in multiple choice questions.
2. To open-ended questions, please write your response on the space provided. Your true response is critically important for the better result of the study.

`` **Thank you!** ``

By BerihuKinf

UNIVERSITY OF Mekele
ETHIOPIA 2016E.C

Questionnaire

General information on Respondent's

Respondent's name town _____

Interview date _____ Questionnaire Code _____

1.1. Name of kebelles

1. 01 keblle 2. 02 keblle 3. 03 keblle 4.04 keblle

1.2. Sex of household head: Male =1 Female =0

1.3. Educational status (in years of schooling) _____

1.4. Age of household head ----- (years)

1.5. Marital status: 1. Single 2. Married

1.6. Size of household-----

Section B: Total questionnaire about nonfarm activities

1. Primary activity of the households Farm Nonfarm or diversify

2. If your answer for question number 1 is nonfarm, which one of the following is the

No	Activities	yes	no
1	construction (,Contracting ,Mining and Quarrying Sector, Sub-contracting ,Cobble stone works, Sub-contracting for infrastructure construction,)		
2	trade (Wholesale of local products and Retail trade of local products, Raw material supply),		
3	service (Rural and small scale transport services, Cafeteria and restaurant, Warehousing services, Tourist services, Packaging services, Management services, Municipal services, Project engineering services, Product design and development services and Landscaping, urban greenery, Security and cleaning services, Beauty salons ,Decoration services ,Internet café, Garage and assembly works, Electronics and software development.		
4	manufacturing(house hold level smalls call food and local drink preparation, Food processing and beverage , traditional handicrafts, , Textile and garment and Leather and leather products , Wood works including furniture and Metal works and engineering, Traditional handicrafts and jewelries , Construction materials production, Agro processing)		

activity of the household?

Other identify -----

3. If your answer for question number 1 is nonfarm, do you have working premises?

1. Yes 2. No?

4. If your answer yes, what is the source of your premises?

1. Governments 2. Privet 3. Rent

5. If your answer for question number 1 is farm, which one of the following is the activity of the household?

- 1. Crop (irrigation) production
- 2. Livestock
- 3. Poultry
- 4. Bee keeping
- 5. Other, identify

 -

6. If your answer for question number 1 is farm, what is the source of your premises?

- 1. Governments
- 2. Privet
- 3. Rent

7. If your answer for question number 1 is diversify, what is the source of your premises?

- Farm= 1. Governments
- 2. Privet
- 3. Rent

- Off farm =2. Governments
- 2. Privet
- 3. Rent

8. Do you think nonfarm activities are an essential package for urban livelihood continued existence?

- 1. Yes
- 2. No

9. Which type of nonfarm livelihood resources found in your area?

Explain-----

10. Do you have an access to credit services? 1. Yes 2. No

11. If your answer is yes for question 10 what are the sources of credit institutions?

- 1. Microfinance institutions
- 2. Cooperatives
- 3. Bank
- 4. Community based institutions
- 5. Traditional lenders
- 6. Relatives
- 8. Other

12. For what purpose do you take the credit?

- For nonfarm activities farm activities

13. If your answer for Question 10 is No, what was the reason?

- 1. I have not any interest to take credit.
- 2. I have excess capital to do these activities
- 3. Because high amount of interest rate
- 4. Credit services is not available

5. Other specify-----

14. If you participate in nonfarm activities how much is your annual household gross income now approximately? -----

15. If you participate in farm activities how much is your annual household gross income now approximately? -----

16. If you participate in both activities how much is your annual household gross income now approximately? -----

17. Do you save money from this income? 1. Yes 2. No.

18. Question no.17 if you say yes how much you save? -----

19. What is the importance of accessibility of credit finance institution for nonfarm diversification?-----

20. What is the role of nonfarm activities for sustainable urban livelihood? -----

21. What contributes the nonfarm activities for sustainable livelihood of the urban people?

22. Do you think you be food secure and self-sufficient if you do farming participation?
1. Yes 2. No

23. If your answer is no for question 22 what are the solution to be food secure?-----

24. What are the opportunities for diversifying the nonfarm activities in your kebele?

25. What are the major constraints of nonfarm diversifications in your area? This is one of your livelihood options, in sustaining your livelihood.

No	Constraints	Yes	No
	Lack of transport		

	Lack of access to road services		
	Lack of access for electricity services		
	Lack of access to water supply		
	Lack of access for telephone service		
	Lack of access to working premises		
	Training center		

If their others specify-----

26. What are the options nonfarm livelihood diversifications in sustaining urban household livelihood? ---