# ADDIS ABABA UNIVERSITY

# SCHOOL OF GRADUATE STUDIES

## ANALYSIS OF URBAN FRINGE HOUSEHOLD VULNERABILITY TO POVERTY IN A LOW-INCOME AREA IN ADDIS ABABA CITY: A CASE STUDY OF HACHALU HUNDASA ZONE OF KOYE FECHA SUB CITY

***HANAN NESRU***

**Addis Ababa,**

**Ethiopia July, 2025**

# ADDIS ABABA UNIVERSITY

# SCHOOL OF GRADUATE STUDIES

# ANALYSIS OF URBAN FRINGE HOUSEHOLD VULNERABILITY TO POVERTY IN A LOW-INCOME AREA IN ADDIS ABABA CITY: A CASE STUDY OF HACHALU HUNDASA ZONE OF KOYE FECHA SUB CITY

***Hanan Nesru***

***A Thesis Submitted to the Department of Economics School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Award of Degree of Master of Science in Economics (Developmental Economic)***

**Addis Ababa,**

**Ethiopia July, 2025**

**ADDIS ABABA UNIVERSITY**

**SCHOOL OF GRADUATE STUDIES**

**ANALYSIS OF URBAN FRINGE HOUSEHOLD VULNERABILITY TO POVERTY IN A LOW-INCOME AREA IN ADDIS ABABA CITY: A CASE STUDY OF HACHALU HUNDASA ZONE OF KOYE FECHA SUB CITY**

**Approved by the Board of Examiners:**

| | | |
|---|---|---|
| Dr. Wassie Beshanu | | 18/08/2025 |
| Advisor | Signature | Date |
| Dr. Martha Fikru (PHD) | | 04/08/2025 |
| Internal Examiner | Signature | Date |
| Urgaia Rissa(PhD) | | 26/07/2025 |
| External Examiner | Signature | Date |

# Declaration

## Addis Ababa University

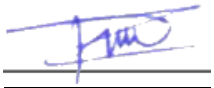
## College of Business and Economics Department of Economics

This is to certify that the dissertation prepared by Hanan Nesru, entitled "Analysis of Urban Fringe household Vulnerability to Poverty in low Income Areas in Addis Ababa sub city: A Case Study of Hachalu Hundasa Zone of Koye Fecha Sub City." is my thesis and submitted in partial fulfillment of the requirements for the Masters in *Science in Economics (Developmental Economic).*

The thesis is original and has not been submitted for the award of any degree or diploma to any University or Institutions

## Declared by;

Name: Hanan Nesru

Signature  Date 25/7/2025

## Conformed By Advisor;

Name: Dr.Wassie Brhanu

Signature _____Date _____

# Acknowledgments

*First and foremost, I thank God for His grace and guidance, which have been a constant source of strength and inspiration throughout this thesis journey.*

*Secondly, I would like to thank my thesis advisor Dr. Wassie Brhanu, for his helpful suggestions and committed follow ups throughout the year, without which this paper would not be what it is.*

*Thirdly my heartfelt thanks also go to the Koye Fecha administration office for their timely assistance and for providing critical information during the data collection period. I would also like to express my sincere gratitude to the households in the study area for their valuable contributions, time, and cooperation throughout the study. Their willingness to share their time, knowledge, and perspectives was essential to the success of this research, and their insights were crucial in enhancing the quality of my work.*

*Last, I thank my family for their love and understanding; has been a constant source of motivation and strength. Also thank you to my friends and colleagues at Addis Ababa University, your companionship and intellectual discussions have enriched my academic journey, making it enjoyable.*

*Thank you all for your support and inspiration throughout this journey.*

# CONTENTS

## *Table*



## *Figure*



## *Appendixes*

# Acronyms and Abbreviations

**ADRI** - Adult Dependency Ratio Indicator

**AE**-Adult Equivalent

**CE** - Certainty Equivalent

**CSA** - Central Statistical Agency

**ETB** - Ethiopian Birr

**ESS** - Ethiopian Statistical Service

**FAO** - Food and Agriculture Organization

**FGLS** - Feasible Generalized Least Squares

**FGT** - Foster-Greer-Thorbecke (Poverty Measure)

**GDP** - Gross Domestic Product

**HCEI** - Household Consumption Expenditure Index

**HICES** - Household Income Consumption Expenditure Survey

**Hhs**-Household size

**Koye Feche** - Sub-city of Sheger City, Oromia Region, Ethiopia

**OLS** - Ordinary Least Squares

**PCAE** - Per Capita Adult Equivalent

**SDG** - Sustainable Development Goal

**UN-Habitat** - United Nations Human Settlements Programme

**UNDP** - United Nations Development Programme

**VEP** - Vulnerability as Expected Poverty

**VER** - Vulnerability as Uninsured Exposure to Risk

**VEU** - Vulnerability as Uninsured Exposure to Risk

**WHO** - World Health Organization

**Woreda** - District/Administrative Subdivision in Ethiopia

# *Abstract*

*The study is aimed to examine the extent of vulnerability to poverty with the current poverty status among urban fringe households in Addis Ababa in case of Hachalu Hundesa Zone .The research examined the socio-demographic and economic factors contributing vulnerability to poverty among households in low-income areas. The study used a cross-sectional survey methodology, gathering data from 267 households. The study reveals that a significant proportion of households, approximately 35.6 % headcount poverty, highlighting the extent of economic vulnerability. The Feasible* Generalized Least Squares *estimation was adopted to estimate the vulnerability to the poverty status of the respondents; results showed that 99.9% were vulnerable to becoming poor in the future. It is found that key socio-demographic factors, such as household size, gender disparities, educational status, and limited access to essential services significant associated with household poverty. In the study area of Female-headed households, 34.8% have low educational levels, contributing to limited employment opportunities. This analysis underscores the importance of education and stable employment in mitigating vulnerability. Another factor of increasing household sizes and inadequate access to utilities like proper sanitation and electricity further impede economic mobility. In the study Informal employment 66.6% and reliance on informal support networks highlight that many households experience financial instability. However the government support programs, such as skills training, are available. Food subsidies for microfinance benefit some, but their underutilization highlights the need for improved outreach and accessibility. The study recommends enhancing educational access, expanding employment opportunities, improving infrastructure, raising awareness household size reduction, and designing policies to increase household disposable income, thereby alleviating poverty and strengthening resilience.*

# CHAPTER 1

# INTRODUCTION

## 1.1 Background

Vulnerability to poverty refers to the likelihood of falling into or remaining in poverty due to various factors, not only the current state of poverty but also the susceptibility to future poverty. These factors, including economic, social, and demographic characteristics, increase vulnerability to poverty (Chaudhuri et al., 2002; World Bank, 2000).

It becomes essential to comprehend the risk attached to falling below the poverty line due to the inherent nature of poverty. The deprivation of food, clean drinking water, adequate housing, medical care, and education best describes this condition (World Bank 2000). Being at risk of poverty refers to being on the verge of falling below the poverty threshold in the future (Pritchett et al., 2000). This concept deviates from the approach to assessing poverty, living below the poverty threshold.

There is a distinction between poverty as a static measure of current income or consumption and vulnerability as the risk of falling into poverty even if someone is above the poverty line (Ligon and Schechter, 2003). On the other hand, researchers can broadly interpret vulnerability as an ex-ante measure of well-being, which reflects not only the current state of household poverty but also its prospects for improvement. The risk and uncertainty of future well-being distinguish the two. Uncertainty is what households face regarding future outcomes, driven by multiple sources of risk, such as rising food prices or the illness of the household's factor income earner. The concepts of ex-ante (vulnerability) and ex-post (poverty) as measures of well-being would essentially converge if there were no risks involved, allowing us to predict the future with certainty (Chaudhuri et al., 2002).

As a result, additional risks or shocks make them more vulnerable to getting into poverty or experiencing unfavorable outcomes. Poverty can lead to increased vulnerability. There are many causes of Vulnerability, including rapid population growth, poverty and hunger, poor health, gender inequality, low levels of education, hazardous location, and lack of access to resources and services like knowledge and technological means. (Damas and Rayhan 2004)

According to World Bank reports, over 700 million people are living on less than $2.15 a day due to extreme poverty worldwide. Extreme (less than $2.15 per daily income) poverty indicates that the minimum income or consumption to meet basic needs is predominantly found in developing states, particularly in sub-Saharan Africa and South Asia regions. (World Bank, 2023)

Poverty alleviation is a primary development goal in Ethiopia, like many other developing countries. The analysis based on the national HICES data from 2010/11-2014/15 indicates that there has been a reduction in both rural and urban populations living in poverty. According to the World Bank (2016), there was a decline in national poverty rates from 29.6% to 23.4% from 2015 to 16, respectively. Specifically, in urban areas in Addis Ababa, the proportion of the population living below the national poverty line fell from 28.1% to 16.8%.

However, vulnerability to poverty continues to be a serious concern, especially in the urban fringes, where rapid urban growth meets population growth with limited infrastructure. These transitional zones fall between urban centers and rural peripheries and are often the sites where low-income households are. Despite national improvements, these communities continue to face high exposure to economic shocks, limited public services, and suffer social exclusion. Studying the urban fringes of poverty is important to determine the vulnerability to poverty and to suggest coping mechanisms for the study.

The study focuses on one urban fringe area, located in Koye Feche Sub-city within Hachalu Hundasa zone, on the outskirts of Addis Ababa. This zone forms part of the transitional area between the capital cities and surrounding rural regions, with income-concentrated households in the study area. Due to the high exposure of these households to economic, health, and environmental shocks, the sample under study was taken from low-income households. They are usually unable to cope with shocks or recover from them due to some limitation in resources, or they need support systems to help with the absorption or recovery processes. Restriction on appropriate opportunities for employment, payment, credit facilities, or public service usage makes them the worst hit in falling into poverty or remaining in it.

This research integrates theoretical and empirical literature that analyzes low-income households' vulnerability to poverty by using household consumption data collected from study areas of the urban fringe.

This study aims to explore the determinants of urban fringe household vulnerability to poverty level in Addis Ababa using the FGLS Method and evaluate vulnerability to poverty reduction efficiency with descriptive analysis.

## 1.2 Statement of the Problem

Ethiopia is one of the poorest countries in the world, has been battling rural poverty since Dercon's work in 1999. While Dercon focused on the socio-economic challenges in rural areas, did not provide a comprehensive picture of poverty across the entire country. Therefore, study of urban poverty is very important Because the poverty situation in cities changes from time to time in cities like Addis Ababa, especially cities are quickly growing due to the factors such as migration, unemployment, and inadequate infrastructure low-income households (UN-Habitat, 2018; Molla, 2020). Despite considerable attention to rural poverty, urban poverty in Ethiopia remains underexplored (Tafere, 2021). The existing research although the country has experienced economic growth, this has not translated into substantial poverty reduction in Addis Ababa's urban areas (UNDP, 2022). These realities indicate the importance of studying poverty dynamics specifically in urban contexts.

According to independent estimates by UNDP (2024), Ethiopia's GDP growth is projected to decline to 4.5 percent in 2023 and to increase to 5.3 percent in 2024, despite the higher official figures. Although per capita income is widely used, it does not adequately show the complex realities of urban poverty. For poverty vulnerability studies, we always need to know the true state of the country. This study also provides an overview of the current state of poverty and its future prospects in fringe urban areas. Further assessment of the overall socio-economic vulnerability of urban residents is crucial to addressing poverty (FAO, 2020). Poverty remains a major concern in Ethiopia, and the United Nations Sustainable Development Goals (SDGs) have made it a key focus of SDG 1: End poverty in all its forms or from source (UNDP, 2022). Such

studies are essential to achieving this goal. The study aims to fill the research gap, by analyzing the vulnerability and coping strategies of low-income households in fringe urban areas.

In Ethiopia, vulnerability assessments have primarily focused on income or consumption-based measures, often overlooking broader socio-economic factors such as health, education, housing conditions, and access to essential services. A more comprehensive understanding of these vulnerabilities is essential for designing effective interventions that address the diverse and evolving needs of urban populations (FAO, 2020). While the existing literature has focused on rural poverty and agricultural vulnerability, despite growing challenges, urban areas, particularly rapidly expanding cities such as Addis Ababa, remain insufficiently studied in poverty-related research. (Tafere, 2021; Molla, 2020). Therefore, this study addresses the gap by analyzing Addis Ababa's urban fringe areas to understand patterns of urban poverty in Ethiopia's rapidly urbanizing areas.

The urban fringe areas of Addis Ababa often face various problems, including the lack of basic services such as water, electricity, education, and sanitation, which expose them to extreme poverty. Many researchers have identified these reasons, including the World Bank (2021), UN-Habitat (2010), and Chak (2010). Such places have problems similar to those in urban and rural areas, such as poor infrastructure and social and economic exclusion, which lead people to high living pressures. While the city offers economic opportunities, they are rarely accessible to low-income households. Many residents rely on the informal sector for employment, citing job insecurity and income instability (Cheng & Tesso, 2018; Alemu & Demissie, 2020). The lack of essential services, poor health infrastructure, and inadequate educational facilities further marginalize these households, perpetuating cycles of poverty (UN-Habitat, 2020). Limited skills or education restrict access to formal employment, forcing many to contnue on precarious, Informal workers are poorly paid (Cheng & Tesso, 2018). This situation underscores the need for targeted policies that address the structural challenges faced by marginalized communities and explore economic opportunities that can reduce urban poverty (Alemu & Demissie, 2020).

In light of these realities, the research aims to fill gaps in empirical evidence, focusing on the socio-economic aspects and vulnerabilities of low-income households in the suburbs of Addis Ababa, and to identify the strategies used by people living in these neighborhoods to address the challenges they face. These vulnerable households face persistent challenges. Previous literature

does not adequately address urban fringe poverty and emphasizes either rural or urban poverty. Furthermore, there is little literature examining the relationship between household income, education, employment, and vulnerability in urban fringe settings in Ethiopia. Such timely research is needed to address those issues.

The findings from this research provide a clearer understanding of the causes of poverty in the urban fringe areas of Addis Ababa and the factors contributing to their vulnerability.

## 1.3 Objectives of the study

### 1.3.1 General objective

The general objective of this study is to analyze urban household vulnerability to poverty among low-income households in urban fringe selected areas of Addis Ababa city.

### 1.3.2 Specific objective

Specifically, the study attempts:

- To analyze the socio-economic characteristics of low-income households in selected areas in urban fringe households in Addis Ababa.
- To determine vulnerability to poverty of urban households in the selected areas
- To examine the coping strategies employed by low-income households to combat impoverishment

## 1.4 Significance of the Study

In Ethiopia, most studies focus on rural and urban vulnerability to poverty, but this research focuses on low-income urban vulnerable suburbs in Addis Ababa. The study results will help government agencies and policymakers to develop the right social protection programs and poverty-reduction strategies. Moreover, the research identifies the need for an in-depth analysis of vulnerability to poverty, especially in the face of rapid urbanization and population growth in Addis Ababa. By using cross sectional data the study also contribute to the broader understanding of urban fringe vulnerability to poverty; provide a recent and detailed account of

vulnerability in the study area, And more, contributing to the global call for action under the Sustainable Development Goals. The results shall form a reference for other similar urban fringe areas around the world in an attempt to reach out for a more resilient and inclusive city worldwide.

## 1.5 Scope of the Study

The study investigates the vulnerability of low-income households to urban poverty in the Addis Ababa urban fringe area. The researcher analyzed the data collected from households in selected districts (weredas) on the outskirts of the city. This research paper analyzes the socio-economic and demographic characteristics of the areas under study to find out the main contributing factors to poverty vulnerability, access to basic services, housing quality, and job opportunities.

## 1.6 Limitations of the Study

The study addressing poverty vulnerability among households along the urban fringe in a low-income area of Addis Ababa is a delimited analysis of specific factors contributing to this vulnerability. First, it is limited to low-income suburbs of the city that did not capture the entire urban setting of Addis Ababa. The research mainly looks at poverty from a financial point of view, specifically how much households spend. It does not consider other important aspects like social welfare .Moreover; the study uses cross-sectional data, estimating vulnerability to expected poverty that fails to account for the temporal variability of parameters over time. This research is also absent sufficiently of qualitative data that could help understand better the predicament of the affected households. In addition, in this study lacks sufficiently into other factors, such as ethnicity, which may lead to household vulnerability. Finally, the exclusive focus on income and expenditure is insufficient to describe the character of poverty in the urban household. In this research not include multidimensional poverty approach, which considers a variety of indicators, is more effective in identifying poverty or vulnerability.

## 1.7 Organization of the Study

The study organized in to five chapters each focusing on a specific aspect of the research. Chapter one, presents background of the study. Chapter Two offers a comprehensive analysis of both theoretical and empirical studies regarding vulnerability to poverty, particularly within low-income families. It analyzes the literature regarding key concepts, theoretical models, and a compilation of current research that investigates the assessment and factors contributing to poverty vulnerability. Chapter Three presents the research methodology, thoroughly detailing the approach taken concerning data collection methods, sampling strategies, and analytical instruments. Chapter Four examines the analyzed data and insights in connection with the literature discussed in Chapter Two. In  Finally, chapter five discloses conclusions and recommendations. The framework reveals an in-depth examination of the difficulties associated with poverty susceptibility in low income households.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1 Theoretical Literature

### 2.1.1 Relationship between poverty and well-being

Well-being and poverty are interconnected concepts; both relate to achieving a certain quality of life in which an individual or household can meet their basic needs. Well-being can be defined in various ways: one perspective defines it as the ability to command and control resources. The more access there is to resources, the higher the living standard; another approach to understanding poverty highlights the significance of access to fundamental necessities, including food, shelter, and healthcare (Chiappero-Martinetti, 2014; World Bank, 2023).

The capability approach, introduced by Sen (1987), defines capability as an individual's ability to achieve valued functioning's—things people have reason to value, such as being healthy and educated. From this perspective, well-being depends on one's ability to function effectively in society, while poverty reflects limitations in resources and capabilities. A lack of capability increases vulnerability to shocks like income loss. Thus, poverty is more than an income loss; additionally, a deprivation of opportunities and choices.

The poverty line serves as a threshold distinguishing whether households fall below or above the poverty level, based on either absolute or relative standards of income or consumption. An Absolute poverty line is minimum level of food and non-food expenditure required for survival determines: Households with consumption below this threshold are considered poor. In contrast, to draw a relative poverty line as a proportion of means expenditure, typically one-third or two-thirds of the average. Due to the unpredictable nature of income over time, developing countries often use consumption data, which is more stable and easier to measure, as an indicator of household welfare (Ravallion, Chen, and Sangraula, 2009).

### Poverty line

The household welfare measure consumption expenditure forms the foundation for determining a poverty line, which serves as cut-off point to classify households as poor or non-poor. Generally, defining poverty as a situation where an individual or household fails to meet household basic food and non-food consumption needs. To establish the poverty line by identifying a consumption bundle that can meet these basic needs and then calculating their cost. Thus, the poverty line represents the minimum level of consumption an individual needs to satisfy both food and non-food requirements.

Furthermore, this is a household's consumption with the poverty line to determine if it falls below the poverty threshold. A household must achieve the poverty line as the minimum consumption (or income) level to avoid being considered impoverished. Because well-being is continuous, the idea that a step above one individual needs to satisfy both food and non-food requirements is questionable. It is reasonable to specify more than one poverty line. The first line needs to separate poor households from non-poor, and the second line can target the most deprived households as extremely poor, introducing a lower threshold than the first living condition. Calculating the food poverty line involves determining the minimum expenditure required for a household to purchase an essential food bundle needed to meet basic nutritional requirements. It does not include the cost of non-food items.

## 2.1.2 The standard measures of poverty

The headcount index is the most commonly used measure of poverty due to its straightforwardness in indicating the proportion of people living below the poverty line. However, there are several crucial axioms that other poverty measures satisfy. The Watts measure is a more comprehensive tool that adheres to all desirable axioms, including those related to the depth and severity of poverty, possibly due to its complexity compared to the more intuitive headcount index. Additionally, the headcount index provides an easy-to-understand measure of poverty incidence; it does not show for variations in the severity of poverty among

individuals below the poverty line. Furthermore, the headcount index remains widely used due to its simplicity and ease of interpretation; more comprehensive measures, such as the Watts index, offer a deeper understanding of poverty by incorporating both incidence and intensity in their assessments. (Morduch, 1998)

## Headcount Measure

The headcount measure is one of the most basic and widely used methods to assess poverty. This is a proportion of a population whose income falls below the poverty line. This straightforward approach allows researchers and policymakers to monitor the most direct aspect of poverty, namely the number of individuals or households experiencing deprivation.

To compute the headcount index by averaging an indicator variable .The weigh based on the number of individuals in each household.

The overall headcount ratio H is then the ratio of the number of poor individuals to the total population:

$$\boldsymbol{H = \frac{G}{N}}$$

When used as the sole measure for poverty reduction. It has limitations notably; the headcount does not reflect changes in the severity of poverty. If a very poor person becomes either slightly less poor or even poorer, the headcount remains the same. This issue arises because the measure only considers whether an individual is below or above the poverty line, ignoring the intensity of poverty among poor households.

Critics such as Watts (1968) and Sen (1976) argue that changes in the income distribution among those living below the poverty line are morally significant**.** The transfer axiom captures this concern by emphasizing the redistribution of resources among poor households. But the headcount measure fails to account for such transfers, leading to an incomplete picture of poverty.

To improve the headcount measurement, one approach is to calculate headcounts for sub-poverty lines thresholds lower than the overall poverty line. Tracking the population under these sub-poverty lines can provide a more detailed view of poverty and is a useful descriptive tool for understanding the depth of deprivation across different income levels.

## Poverty gap

The poverty gap is a measure that reflects the total amount of money required to increase the income of individuals or households below the poverty line. It indicates the extent of deprivation by calculating the shortfall in income for those living in poverty. This measure can vary depending on how income and the poverty line are defined by being measured on a per capita basis or adjusted for adult equivalents or economies of scale (Milanovic, 2002).

The poverty gap calculates the total amount of money needed to bring the income of all poor households up to the poverty line.

However, when income is measured in adult equivalent terms (to account for differences in household size), the formula is adjusted: the measurement can be adapted accordingly by replacing income and household size with adult-equivalent-adjusted variables.

### Average Poverty Gap

To calculate the average income shortfall for individuals in poverty an indicator of deprivation—the poverty gap index is used. This index reflects the average proportional shortfall show as how far below the poverty line the poor fall, not just how many people are poor. The average poverty gap provides the average income gap for the impoverished population.

The measure is expressed in monetary units, while converted into a common international currency (such as dollars or euros) for comparison across different countries or regions.

## Normalized Poverty Gap

To facilitate comparisons across regions and currencies, the poverty gap can be normalized by dividing the shortfall by the poverty line. This normalization of the poverty gap as a percentage of the poverty line helps in comparing different countries or periods.

## Population-Wide Poverty Gap

Another approach, known as the Population-Wide Poverty Gap, divides the total income shortfall by the entire population, not just the poor. This method incorporates data from both the poor and non-poor, but it sacrifices the clarity of interpreting individual deprivations.

Unlike other versions that consider only the poor, this version divides the poverty gap by the total population. While this broadens the scope, it complicates interpretation by including non-poor individuals. However, it better captures overall progress, as the gap decreases when people exit poverty something earlier versions might miss, even if conditions improve. Although it may not satisfy the transfer axiom, which emphasizes helping the poorest, it still offers valuable insights into broader poverty trends and should complement other measures.

## Poverty Gap Index ($P_1$)

The Poverty Gap Index ($P_1$) measures the average shortfall of income of poor individuals relative to the poverty line shows the proportion of the total population. It quantifies how many people are poor, and also how far below the poverty line their incomes are.

This measure calculates the total income shortfall divided by the total population, providing an indicator of the depth of poverty within society and obtains the shortfall as a proportion of the poverty line. The sum of these individual shortfalls is then divided by the total population, providing a measure of the average poverty depth for both the poor and the non-poor.

## Watts's index

The Watts index introduced by Watts in 1968.whereas, the poverty measurement is based on the transfer axiom. When converting income into adult-equivalent terms, the size of the households taken into account. The measure is distributionally sensitive due to its use of logarithms, making it more responsive to changes in the incomes of the poorest individuals. This logarithmic approach makes the Watts index more sensitive to income transfers to those with very low incomes, even if both low and higher incomes are below the poverty line. The measure prioritizes resources for the poorest, similar to the squared poverty gap, and is decomposable, allowing for poverty analysis by different groups or regions. However, the Watts index assigns relatively similar weights to the poorest and moderately poor, while placing more emphasis on the most destitute. This may make the squared poverty gap a more useful measure for distinguishing different levels of deprivation.

## Squared poverty gap

The squared poverty gap, a more distributionally sensitive measure, is part of a broader class of poverty measures developed by Foster, Greer, and Thorbecke (1984). These measures are widely used in poverty analysis and are particularly useful when focusing on the most impoverished groups.

## 2.1.3 Conceptual definition of vulnerability to poverty

Vulnerability is defined as the likelihood of a household falling below the poverty line in the future; indicate that even if it is currently not impoverished, it will remain impoverished if it has already crossed the threshold. Additionally, vulnerability is a forward-looking measure of well-being, focusing not just on a household's present status but on its prospects. Vulnerability measures the degree of risk and uncertainty regarding future well-being (Chaudhuri et al., 2002).

The outcome approach depicts vulnerability as the likelihood of an individual or household experiencing poverty over some time, offering a unique viewpoint on vulnerability. This approach uses current household income or expenditure as an indicator of well-being and aims to

estimate the likelihood of future poverty. A poverty line is a threshold to categorize households as poor or non-poor. Chaudhuri's definition overviews the predictive outlook of vulnerability, aiming to estimate future poverty risks rather than only assessing current poverty status.

While both Chaudhuri and Christiaensen & Subbarao define vulnerability in terms of future poverty, Chaudhuri focuses on the likelihood of falling into poverty and discusses expected poverty, a measure of future poverty risk. Expected poverty refers to the probability that a household will experience poverty in the future, based on various factors, such as income, assets, education, health, location, and social marginalization, all of which increase vulnerability (Christiaensen & Subbarao, 2005; Chaudhuri, 2003).

McCulloch and Calandrino (2003) define vulnerability as the "probability of falling below the poverty line at any given time, which implies an ongoing threat of poverty. On the other hand, Watts and Bohle (1993) provide a more comprehensive understanding of vulnerability. They identify exposure to external hazards and internal factors, such as a household's ability to gather resources and the inherent inflexibility of pitfalls of crucial aspects of vulnerability.

Ligon and Schechter (2003) explore the concept of risk exposure and its impact on well-being, especially in situations of uncertain consumption.

Anticipated household consumption refers to the average level of consumption that a household expects based on its actual consumption over time. Furthermore, original consumption is the amount of consumption that would provide the same level of satisfaction in a stable environment. This difference, or household gap, measures the loss of well-being due to the query. From an outgrowth-grounded perspective, vulnerability highlights the loss of unborn wealth to implicit poverty, taking into account the current situation and the potential risks associated with unborn shocks. (Quisumbing, 2002)

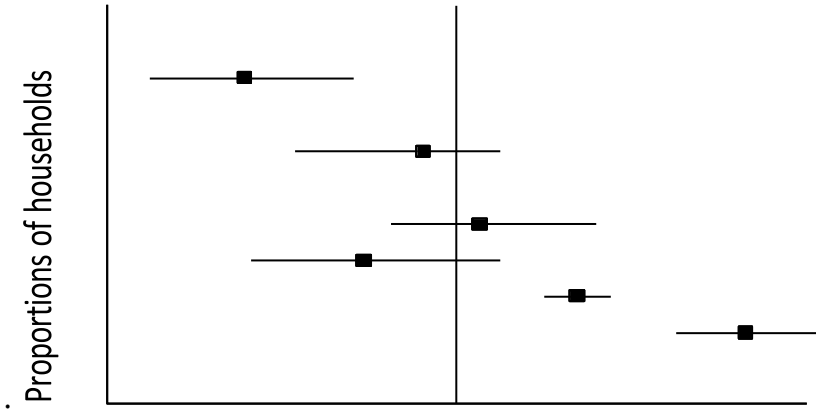
In other words, Ligon and Schechter (2003) defined vulnerability as arising when there's a difference between what a household hopes or expects to gain (in terms of well-being) from its future, uncertain consumption, and what it gets from the consumption it ends up with. Beyond these theoretical perspectives, we can also view vulnerability through the lens of threat operations. Households and individuals often employ strategies to escape pitfalls and prevent themselves from falling into poverty. The vulnerability exists in three introductory combinations:

exposure to threats, the ability to manage pitfalls, and the implicit issues associated with these situations.

The household's ability to respond to risks and shocks over time, along with its access to resources, influences the degree of vulnerability.The poor and near-poor are particularly vulnerable because they possess limited assets and have fewer options for managing risks.(Alwang & Siegel, 2000) Employing a "risk chain" framework can reduce vulnerability to poverty. The vulnerability framework contains three components: (a) risk realization, which means identifying potential risks; (b) risk management, which includes strategies to cope with and mitigate risks; and (c) outcomes, which measure the effectiveness of these strategies and their impact on well-being (Heitzmann et al., 2002).

Alwang et al. (2001) assert that when formulating policies to alleviate poverty, it is important to consider the various household approaches to risk management. Heitzmann et al. (2002) approached this subject by studying the dynamics of poverty and how shocks, resource constraints, and social exclusion have contributed to creating vulnerability. Moreover, both studies significantly contribute to the understanding of vulnerability and poverty, and should therefore inform the design of risk management strategies and the examination of deeper structural causes. While Alwang et al. use a household approach that focuses on risk issues, Heitzmann et al. attempt to expose the underlying causes of increasing vulnerability; thus, together, they provide different yet complementary perspectives.

**Figure 2.1: Expected levels of consumption, t+1**

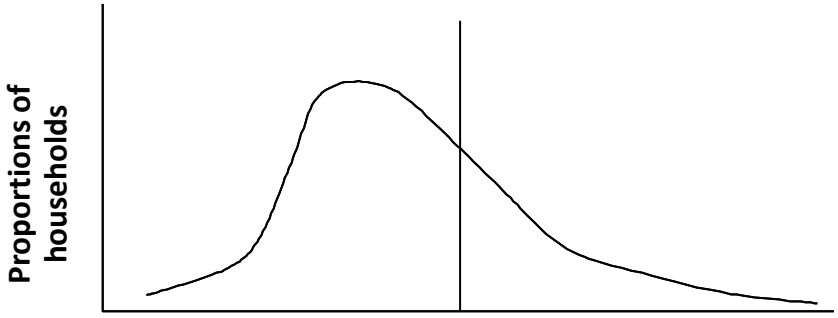



Note. Z poverty line, Expected level Consumption, t+1

Source: Author (Hoddinott, Quisumbing, 2003)

From the above figure, the vertical axis displays the anticipated or prognosticated consumption situations at t +1 in the future, while the perpendicular axis indicates the proportion of homes in that prognosticated consumption position. Additionally, different homes have varying exposure to shocks and management mechanisms, and the filled blocks represent the anticipated (mean) quantitative consumption. ( Hoddinott, Quisumbing, 2003

**Figure 2.2: Realized distribution of consumption, t+1**




Note. Z poverty line, Consumption, t+1

Source: Author (Hoddinott, Quisumbing, 2003)

Similarly, unexpected shocks may occur at time t+1, while others may not. The combination of these shocks, along with the factors that influence average consumption conditions, results in a distribution of consumption that resembles the figure above.

### 2.1.4 The relationship between poverty and vulnerability to poverty

Poverty and vulnerability have a complex and dynamic relationship. Vulnerabilities can either increase or prolong poverty, while poverty likewise can also increase or prolong vulnerability. The interaction between the two is not straightforward, but vulnerability significantly raises the likelihood of falling into poverty.

Vulnerability and poverty are not similar but may share similarities. Vulnerability analysis is a risk factor, making individuals or households more susceptible to the negative impacts of external shocks such as economic downturns and others. Those Shocks expose existing vulnerabilities, often pushing individuals or households into poverty.(Holzmann & Jorgensen, 2001; Chaudhuri, 2003).in this context Vulnerability refers to the probability that an individual or household will fall below the poverty line in the future.

Even if a household is not currently as impoverished, its vulnerability increases its likelihood of experiencing adverse events. Vulnerability often affects economic factors like income and consumption.

The negative consequences of vulnerability go beyond economic hardship and affect other aspects of life. These impacts can create economic instability in other aspects of life (e.g., poor health, limited access to education). (Chaudhuri, 2003)

Vulnerability can be close to poverty but not the same, acting as a vulnerability factor that makes individuals or households more susceptible to the negative impacts of shocks (e.g., profitable downturns, natural disasters, health hazards). Shocks spark vulnerability which leading to poverty (Holzmann & Jorgensen, 2001). Chaudhuri, 2003. Vulnerabilities are likely to influence the threat factor for falling into poverty. Furthermore, Chaudhuri (2002) defines vulnerability as

the ante (forward-looking) probability of a household or individual falling below a predefined poverty line in the future.

If a household is presently not considered as poor, their vulnerability makes them more susceptible to falling into poverty if faced with adverse events. Vulnerability invites profitable factors like income or consumption. Social, environmental, demographic, and political factors contribute to vulnerability.

Vulnerability's negative consequences extend beyond profitable difficulty and impact different aspects of life, such as health, education, social good, etc., indicating Interstice expressions. (Chaudhuri, 2003) The above are some general guidelines regarding the conception of vulnerability.

### 2.1.5 Understanding Urban Poverty

Urban poverty is increasing due to various socio-economic and environmental factors. That refers to economic deprivation, including a lack of access to essential services and experiences of social exclusion (World Bank, 2018). Inadequate housing, poor health, and economic shocks are all issues identified by Ravallion (1996) as factors of urban poverty. Poverty can be measured as absolute or relative (Sen, 1999). It is not only about fulfilling basic needs; it also reflects the inability to fully participate in social and economic life due to limited income opportunities.

In addition, Vulnerability to poverty refers to the risk of falling into poverty due to socio-economic shocks and other factors. Chaudhuri, et. al (2002) indicate that interventions must address both short-term necessities and long-term development. Lanjouw and Ravallion (1995) argue that socio-economic influences on poverty, such as the strain on resources in most households, must be considered. Further, demographic factors such as age, gender, and marital status influence the income of the households. For instance, female-headed households are more likely to suffer due to employment opportunities. Moreover, the education system serves as a crucial factor for economic mobility. Several research studies, including Filmer and Pritchett (2001), have documented the relationship between educational achievements and employment. The greater the level of education an individual obtains, the more opportunities there are likely to

be for jobs and increased chances of income earning and stability, thus reducing poverty vulnerability.

Furthermore, low educational levels tend to perpetuate the existence of most informal employment, resulting in low earnings. Devereux (2002) suggests that informal employment is a determinant of self-perpetuating cycles of poverty.

Economic stability is affected by household size, which proves that the more dependents there are on working-age persons in a family, the heavier the load they will have to bear financially (Moser, 1998). This demographic feature is vital in opening the blindfolds to the contextualized, ever-changing reality of urban poverty because families with many dependents may face difficulty meeting basic needs. In addition, the availability of social services, clean water, electricity, and health services is essential in improving the quality of life for the urban population. Rakodi (2002) asserts that the low provision of these services increases poverty and decreases economic activities. Poor households struggle to access reliable utility services, which limits their ability to engage in income-generating activities and improve their quality of life (World Bank, 2020).

The difference in poverty patterns across genders is a critical concern for researchers in urban poverty studies. Systemic barriers—such as limited access to education, employment, and social networks—contribute to the rising number of poor female-headed households, which are often more vulnerable than their male-headed counterparts (Kabeer, 2005). Gender analysis shows that women carry the primary burden of household care, restricting their participation in economic activities. This further undermines their financial stability and limits the effectiveness of sustainable solutions (Hossain, 2005)

## 2.2 Empirical Review

### 2.2.1 Empirical reviews and evidence from Ethiopia

The study of urban poverty vulnerability has expanded significantly over the past decades, and scholars have adopted different theoretical and methodological approaches to understanding poverty dynamics in urban areas. Thus, Chaudhuri (2002) and Dercon (2005) have made significant contributions to vulnerability measurement, approaches primarily focused on rural settings, leaving gaps in our understanding of urban fringe poverty.

Additionally, In Ethiopia there are limited numbers of vulnerability studies found on rural and urban households due to a lack of rich panel or cross-sectional data over an extended period, But Most of the vulnerability studies have historically focused on rural areas, (Dercon, S., & Hoddinott, J. 2013; Alemu & Zeleke 2020, and Hoddinott & Yohannes 2002) .This is because rural areas in Ethiopia tend to have higher poverty rates. In recent years, urban vulnerability to poverty has gained more attention in cities like Addis Ababa, as urbanization increases and new challenges arise (Teshome, 2020; Alemu & Teshome, 2015).

In Ethiopia, 68.7 % live in poverty (UNDP 2021), indicating that the majority of Ethiopians lack access to essential services, which leads to vulnerability to shocks. In rural areas, there were severe droughts between 1978 and 1998, where rural poverty dominated the headlines, and only 15 percent of Ethiopians live in cities that face a high incidence of chronic poverty. Chronic poverty contributes to increased vulnerability, and chronically poor people experience deprivation over many years. Risks individuals face regarding future poverty and the likelihood that they will experience adverse outcomes (e.g., income loss, health shocks). According to Dercon's analysis (2005), vulnerability is not solely about the current state of poverty but also about how individuals and households navigate risks and shocks.

Chaudhuri (2002) studied vulnerability in Indonesia by applying cross-sectional data; several researchers have used cross-sectional data to determine vulnerability to poverty. In his 2002 study, Chaudhuri used cross-sectional data to explore how vulnerability relates to poverty dynamics. He found that income or consumption alone offers an incomplete view of poverty. Factors like healthcare, education, and environmental risks also increase vulnerability. The study

showed that while poor households are more vulnerable, many non-poor individuals face significant risk. For example, in Indonesia, the poverty rate was 23%, but 45% were vulnerable; highlighting that vulnerability often exceeds the observed poverty rate, capturing both current and potential future poverty.

Deacon (2005) and Banerjee (2011) have examined how factors such as income, education, and economic hardship affect household vulnerability. And also Chambers (1997) has examined the impact of social exclusion in rural areas. Whereas; Ravallion (2016) has used cross-sectional data to examine how health and education affect vulnerability and poverty in countries such as Bangladesh. These studies provide the vulnerability level and help identify key risk factors. Chaudhury (2003) applied cross-sectional data methodology for the Philippines and, finding similar patterns that indicate future outcomes. Chaudhuri (2003) defines vulnerability as the ex-ante risk of poverty, indicating the potential for future outcomes rather than the current state of poverty. This definition highlights the need to design proactive policies that prevent vulnerability from turning into actual poverty. Such policy interventions are essential for effective poverty reduction.

Ethiopia (Dercon & Hoddinott, 2013; Taffesse, Dorosh & Asrat, 2012; Kassie & Zeller, 2015; Alemu & Zeleke, 2020) and other researchers have used cross-sectional data to study vulnerability to poverty. Cross-sectional studies provide social and economic factors contributing to vulnerability and identify trends and correlations between socioeconomic factors and poverty outcomes. In contrast, longitudinal studies are crucial to determining vulnerability over time, offering a deeper understanding of its evolution. Econometric methods such as FGLS (Fasible Generalized Least Squares) are used to correct for heteroskedasticity and endogeneity, allowing for more accurate estimates of the effects of variables on outcomes (Dercon & Krishnan, 2003). It is necessary to determine the negative impact of poverty on the level.

## Coping Mechanisms and Household Resilience

Households facing poverty adopt different strategies to navigate financial hardship, including coping mechanisms and methods to alleviate stress. Chambers (1989) identifies several approaches, including borrowing from relatives or friends, participating in informal employment, and cutting back on consumption. Although these strategies enable households to adjust to shifting economic realities, they may lead to challenges by encouraging dependence on informal support networks that lack long-term sustainability (Kabeer, 2002).

## Government Support Programs

Government interventions like skills training, food subsidies, and microfinance play a key role in reducing poverty, though their effectiveness varies due to issues of access and awareness (Morduch, 1999). Another skills training can boost income, but low participation in food subsidy programs points to persistent barriers (Rakodi, 2002)

# CHAPTER 3

# RESEARCH DESIGN AND METHODOLOGY

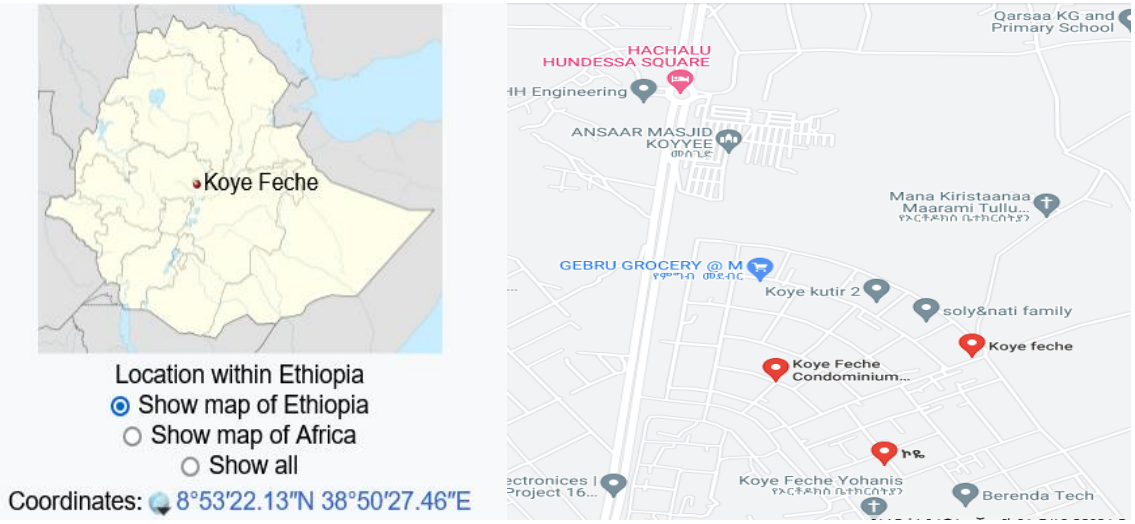
## 3.1 Research Methodology

### 3.1.1 Description of the Study Area

The Koye Feche sub-city is located in Sheger City, within the Oromia Region of Ethiopia. Koye Feche exists in the Oromia Special Zone of Finfinnee, and lies located at latitude of about 8°53′22″N and longitude of about 38°50′46″E. It is also located on the urban outskirts of Addis Ababa, Ethiopia's capital city, serving as a boundary area between the city and the rural regions. Indeed, the Oromia Region, with a density of some 100.27 persons per square kilometer (ESS, 2022), happens to be one of the most populated areas in the whole country.

This study area chosen based on its high concentration of low-income households and the challenges these populations face. Specifically, the research sought to identify factors contributing to household vulnerability to poverty in the urban fringe areas of the zone.

**Figure 3.1: Map of Study Area**




Source; Google Map

Koye Feche is an urban fringe area with a distinct vulnerability due to its proximity to the urban core. These regions typically lack adequate infrastructure and access to vital services and economic prospects. The living conditions in this region are deficient, with limited services accessible. Socioeconomic advancement is restricted, rendering individuals in these regions extremely susceptible to poverty. This research investigates the elements that render households in these regions highly vulnerable to poverty: demographic and socioeconomic factors.

### 3.1.2 Source of Data

The study employed both explanatory and descriptive analysis designs to achieve its objectives. The independent variables selected are based on the relationships between various factors influencing household vulnerability, such as income, access to services, and household coping strategies. The theoretical frameworks used in the study explain how one factor may influence another (Melkamu, 2020)

The research was conducted in the Koye Feche Sub-city of Sheger City, focusing specifically on the Hachalu Hundesa Zone. The zone is divided into six sub-zones: Bakelcha Bari, Biftu Shaggar, Odaa Shanan, Geda Shanan, Horte Kush, and Tokumma Shaggar, areas face socio-economic factors and vulnerability levels.

Primary data were collected using a structured questionnaire administered to households within these sub-zones. The questionnaire gathered information on household demographic and socioeconomic factors of household vulnerability. Enumerators assisted household heads in completing the surveys to ensure the accuracy and reliability of the data collected.

### 3.1.3 Data Collection Techniques

This research on household vulnerability in urban fringe areas collected primary data through structured questionnaires. The questionnaire was carefully designed to gather both qualitative and quantitative information about the demographics, socio-economic conditions, and coping mechanisms of the respondents in relation to poverty.

### 3.1.4 Target Population and Sampling Methods

This research on household vulnerability in urban fringe areas collected primary data through structured questionnaires. The researcher designed the questionnaire to collect qualitative and quantitative data on demographics, socio-economic conditions, and coping mechanisms associated with poverty. A structured format ensured consistency across responses and minimized interviewer bias.

The target population of the study area was estimated. According to the 2024 population estimate for the Koye Feche Sub-city, approximately 1,854 households are located in the Hachalu Hundesa zone. The research aimed to examine the factors contributing to their susceptibility to poverty. And the strategies they use to overcome the economic challenges within their environment.

### 3.1.5 Sampling Method

The study used a stratified random sampling technique with six sub-zones and based on living conditions. This method was chosen to minimize sampling bias. Additionally, a two-stage sampling approach was employed to account for both geographical and socio-economic variations. In the first stage, the population was divided into strata based on the six sub-zones of the Hachalu Hundesa Zone: Bakelcha Bari, Biftu Shaggar, Odaa Shanan, Geda Shanan, Horte Kush, and Tokumma Shaggar.

This stratification considered potential socio-economic differences between the areas.In the second stage, proportional allocation was used to determine the number of households selected from each sub-zone. This method ensures that the sample accurately reflects the distribution of households across the sub-zones. The sample size was then calculated using Kothari's (2004) finite population correction formula.

$$n = \frac{e^2 p * q * N}{e^2(N-1) + z^2 * p * q}$$

Where;-

- n –Sample Size
- N-Total households of the town
- e - Precision level (marginal error) =5.556%
- z - Confidence level (standard variation as per table of area under normal curve for the given confidence level of 95%) = 1.96
- P - Proportion of success (probability to be included in the sample) = 50% = 0.5 based on most conservative sample size.
- q = proportion of fail = (1-p) = 0.5 = 50%

Response rates have been categorized by different researchers as successes or failures for their sample sizes, as noted in Corbetta (2003). An appropriate response rate is 50%, considered good at 60% and very good at 70%. In this investigation, the response rate was at 50% within the 95% confidence level, and the sample size was determined based on the 50% non-response accounted for. In addition, the response rate was 50%. The sample size was calculated at a 95% confidence level, a marginal error of 5.56%, and a confidence interval of 95 %. This marginal error falls within the acceptable range of 3% to 6% commonly used in social science resources (Cochran, 1977 and Yamanes 1967) the value reflects the precision required for assessing vulnerability to poverty without unnecessary rounding, ensuring accuracy and consistency of the result. Therefore, the sample size was determined using Kothari's (2004) finite population formula, as shown below

$$\boldsymbol{n = \frac{e^2 p * q * N}{e^2(N-1) + z^2 * p * q}}$$

The above formula for the sample size was determined by a total population of 10,100 households in the two selected zones of Koye Feche Sub-city. Once the sample size was calculated, the two-stage sampling technique was applied to select a representative sample, yielding data from 267 households.

$$n = \frac{(1.96^2)\ (0.5)(0.5)(1854)}{(0.0556^2)(1854-1) + (1.96^2)(0.5)(0.5)} = \frac{1780.5816}{6.6834} = 267$$

Thus, the sample size required for the study was 267 households.

## Sampling Procedure

A two-stage random sampling technique was applied to ensure a representative sample:

1. First Stage (Stratification): The population of the Hachalu Hundesa zone is divided into within the Hachalu Hundesa zone. There are six sub-zones: Bakelcha Bari, Biftu Shaggar, Odaa Shanan, Geda Shanan, Horte Kush, and Tokumma Shaggar. Stratifying the population by sub-zone accounts for any geographic or socio-economic differences that may exist between the areas.

2. Second Stage (Proportional Allocation): Once the population is divided into strata (sub-zones. The proportional allocation used to determine how many households to sample from each sub-zone ensures that the sample reflects the proportion of households in each sub-zone relative to the entire population of the zone.

The proportional allocation formula is: $\boldsymbol{N = \frac{Ni}{N} * n}$ ----------

Where

- $N_i$=total households in two sub zone
- $N_i$= Number of households in each sub-zone
- N = Total number of households in the study area (1854 households)
- n = Total sample size (267 households),and
- i=1, 2, 3, 4----,

**Table 3.1: Population of Hachalu Hundesa Zone by Sub zones, 2024**

| Sub city | Woreda | Zone | Name of the sub zone | Household size | Total population |
|---|---|---|---|---|---|
| Koye Fecha | Waddesa | Hachalu Hundasa zone | Bakelcha Bari<br>Biftu Shaggar<br>Odaa Shanan<br>Geda Shanan<br>Horte Kush | 1584 | 8629 |
| | | | Tokumma Shaggar | 270 | 1470.874 |
| **Total** | | | | **1854** | **10,100** |

Source: Koye Feche Sub-city, Waddesa Woreda Administrator Office

## Target Population

The target population for this study consists of household heads in the Hachalu Hundesa Zone. According to the 2024 estimates from Koye Feche Sub-city, there are 1,854 households in this zone. The sampling frame was drawn from these households, with the study focusing on understanding their vulnerability to poverty and the coping strategies they employ.

## Sampling Justification

The stratified random sampling method was selected to ensure adequate representation of sub-zones with varying living conditions and poverty levels. The proportional allocation, the sample reflects the distribution of households across these sub-zones. This approach allows the study's findings to be generalized to the entire population of the zone.

**Table 3.2: Composition Sample Households by Zone by proportional allocation**

| Sub city | Woreda | Zone | Name of the sub zone | Household size($N_i$) | Percentage (Ni / N) | Sample household (Ni × n / N) |
|---|---|---|---|---|---|---|
| Koye Fecha | Waddesa | Hachalu Hundasa | Bakelcha Bari Biftu Shaggar Odaa Shanan Geda Shanan Horte Kush | 1584 | 0.854 | 228 |
| | | | Tokumma Shaggar | 270 | 0.145 | 39 |
| **Total** | | | | **1854** | **1** | **267** |

Source: Koye Feche Sub-city, Waddesa Woreda Administrator Office

## 3.2 Econometric Model Specification

### 3.2.1 Poverty measurement method

The generalized by Foster-Greer-Thorbecke (FGT), developed by Foster, Greer, and Thorbecke (1984), better to assess incidence, depth, and severity of poverty. Poverty measures offer a way to make the poverty gap more sensitive to the distribution of income among the poor. By raising individual income gaps to a power greater than 1, this approach increases the focus on the poorest members of society.

$$p_\alpha = \sum_{i=1}^{q} \frac{z - y_i}{z}^{\alpha}$$

Where:

$P_\alpha$ = FGT poverty measure

Z = Poverty line

$y_i$ = Income of individual i (below the poverty line)

N = Total population

q = Total households under the poverty threshold.

α= Sensitivity parameter

The key point is,

**α=0:** The measure reduces to the **headcount ratio**, which simply counts the individuals below the poverty line.

**α=1:** The measure becomes the **normalized poverty gap**, indicating the average shortfall as a percentage of poverty line, but without considering income distribution among the poor.

**α=2:** The measure turns into the **squared poverty gap**, which gives more weight to those furthest below the poverty line, making it distributionally sensitive.

The squared poverty gap helps to focus on the depth of poverty by highlighting the extent to which the poorest are suffering. It is more useful for understanding severe poverty than the simple headcount or poverty gap measures because it reflects both the incidence and intensity of poverty.

### 3.2.2 Measures of vulnerability to poverty

Vulnerability measures aim to account for uncertainty in future consumption when assessing an individual's well-being at a specific point in time. This contrasts with multi-period poverty measures, which evaluate poverty over a historical time frame. Measuring vulnerability is particularly challenging because it is a dynamic concept that cannot be accurately captured through a single observation of households. Only household panel data, which are household surveys that track the same households over the years, can capture and quantify the volatility and vulnerability that impoverished families believe to be so crucial. Furthermore, people's migrations into and out of poverty only reveal vulnerability information after the fact. Finding vulnerability indicators that can proactively identify at-risk households and communities is the challenge. (World Bank, 2000)

Vulnerability as expected poverty (VEP), vulnerability as low expected utility (VEU), and vulnerability as uninsured exposure to risk (VER) are the three main methods used to evaluate vulnerability.

**Vulnerability as expected poverty (VEP)**

To calculates the expected difference between an individual's income and consumption over the poverty line. VEP measurement was proposed by (Chaudhuri, 2002). To calculating VEP Vulnerability of household (h) at time t, will be below the benchmark (consumption poverty line, z), $\boldsymbol{V_{ht}}$ is the probability that the household's welfare (consumption) at time **t + 1** ($\boldsymbol{C_{ht+1}}$)

$$\boldsymbol{V_{ht} = \Pr\left(C_{h,t+1} = z\right)}$$

A higher VEP suggests a broader population segment that may be more vulnerable to poverty disparities. The method considers both the probability and severity of poverty. However, it indicates a single poverty line, which may not fully capture the non-income dimensions of poverty.

**Vulnerability as low expected utility (VEU)**

Measures the expected utility loss individuals face due to potential exposure to risks. Vulnerability is the difference between the utility derived from some level of certainty equivalent consumption $\boldsymbol{Z_{CE}}$, at and above which the household would not be considered vulnerable, and the expected utility of consumption.

$$\boldsymbol{V_h}\textbf{= Ui (}\boldsymbol{Z_{CE}}\textbf{) – E}\boldsymbol{U_h(C_h)} \quad \textbf{(poverty)}$$

$$\boldsymbol{V_h}\textbf{ = [}\boldsymbol{U_h}\textbf{ , (}\boldsymbol{Z_{CE}}\textbf{) – }\boldsymbol{U_h}\textbf{(E}\boldsymbol{C_h}\textbf{)] (covariate risk)}$$

$$\textbf{+ [}\boldsymbol{U_h}\textbf{(E}\boldsymbol{C_h}\textbf{)}$$

$$\textbf{- E}\boldsymbol{U_h(C_h)}\textbf{] (idiosyncratic risk)}$$

A higher VEU indicates a greater expected loss of well-being due to potential shocks, implying a higher vulnerability. It also accounts for individual preferences and risk aversion and considers non-income dimensions of well-being. That requires the estimation of complex utility functions and may not be easily comparable across different populations (Ligon, E. and L. Schechter, 2003).

**Vulnerability as uninsured exposure to risk (VER)**

The term "vulnerability as uninsured exposure to risk"

(VER) refers to the proportion of the population that does not have insurance coverage against specific risks (such illness, unemployment, etc.) that could cause losses in income or consumption. After the event an ex-post evaluation of welfare loss resulting from a negative shock (Quisumbing, 2002). **D ln**$\boldsymbol{c_{htv}}$ as the change in log consumption between **t** and **S(i)htv** idiosyncraticshocks, **S(i)tv** covariate household characteristics $\delta$,$\beta$, $\gamma$ , and $\theta$are parameters to be estimated an $\boldsymbol{\Delta In\ c_{htv}}$ is the error term where the estimated values of $\theta$ and $\beta$ .

$$\Delta In\ c_{htv} = \sum_i \theta_i S_{itv} + \sum_i \beta_i S_{ihtv} + \sum_v \delta_v D_v + \delta X_{hv} + \Delta \in_{htv}$$

A higher VER indicates a larger segment of the population lacking financial protection against potential income shocks, implying higher vulnerability. Simple and intuitive, easy to compare across contexts, highlights a lack of risk management mechanisms. Ignores the severity of potential income losses and individual coping capacities, and doesn't consider non-financial risk mitigation strategies.

### 3.2.3 Model Specification and Estimation Technique for Measuring Vulnerability to poverty

The literature lacks a consensus on the most suitable method for measuring vulnerability, and finding a robust measurement that aligns with fundamental risk analysis principles remains a significant challenge (Scaramozzino, 2006). Expected poverty is an outcome approach that measures vulnerability. This view contrasts with the utility-based measure, which assesses vulnerability in terms of a household's consumption utility with certainty and compares it to the uncertain expectation of consumption.

Chaudhuri et al. (2002) inferred a measure of vulnerability from cross-sectional data, known as Vulnerability as Expected Poverty (VEP). VEP predicts the likelihood of falling into poverty in the future. Therefore, a household currently above the poverty line may eventually be below it, while a household currently poor may not remain poor in the future. It assumes that the variance in per capita consumption across households is solely due to observable household characteristics. For instance Chaudhuri (2001), Chaudhuri, Jalan, and Suryhadi (2002), and Azam and Imai (2009) are examples of the outcome-based approach to vulnerability estimation, emphasizing the impact of expected poverty.

Unlike the utility-based approach, the outcome-based approach measures vulnerability by comparing a household's utility from consumption under certainty with the expected utility from uncertain consumption alone (Ligon and Schecter, 2003, 2004). Chaudhuri et al. (2002) developed a cross-sectional measure of vulnerability defined as Expected Poverty (VEP). The

term vulnerability Expected Poverty (VEP) refers to the likelihood of a household falling below the poverty line in the future, or the probability remains impoverished.

According to the study, all issues of cross-sectional variability in the per capita consumption of households will depend on the observable characteristics of these respective households. To estimate vulnerability using cross-sectional data from a single point in time, the researcher uses a second-step regression that estimates residual variance using weighted least squares. The researcher uses the estimates of residual variance to calculate the likelihood that a household's per capita consumption will fall below the poverty line, which serves as an acceptable threshold for poverty .The log of per capita consumption for each household is a function of a vector of characteristics, such as household size, level of education, and location. We apply Chaudhuri's (2000) approach to ascertain the impact of household and location characteristics on household consumption expenditures. In conclusion, the study adopts the outcome approach to measure vulnerability to poverty, focusing on the determinants of vulnerability in the study areas.

As briefly indicate above, there are three primary methods for assessing vulnerability. These methods include calculating vulnerability as a low expected utility (VEU), calculating vulnerability as expected poverty (VEP), and calculating vulnerability as risk exposure from uninsured parties (VER). This study uses the Vulnerability to Expected Poverty (VEP) method, which can be measured using ex-ante data to assess poverty vulnerability. $\boldsymbol{V_{ht}}$ is the vulnerability of the household h at time t

According to Chaudhuri (2002), vulnerability to expected poverty (VEP) measurement is proposed. To calculate VEP ($C_{ht}$) Vulnerability of household h at time t, will be below the benchmark (consumption poverty line, z) $C_{ht+1}$ is the expected welfare (consumption) of the household at time t + 1

$$\boldsymbol{V_{ht}} = \mathbf{Pr}\ (\boldsymbol{C_{h,t+1}} = \mathbf{z})$$

According to this framework, the household's consumption prospects at time t+1 define the level of vulnerability at time t. This suggests that a household's likelihood of becoming impoverished is based on its expected (i.e. Mean) future consumption as well as the variability (i.e. variance) of

its consumption stream. Therefore, to identify how specific household characteristics are related to vulnerability, we need to estimate how these characteristics influence the variance of consumption (and possibly higher moments).

The vulnerability to poverty indicator was developed by Chaudhuri et al. (2002), along with similar contributions from other researchers, providing a framework for measuring the risk of falling into poverty. As a result, a method for predicting home consumption variation from cross-section data requires quite strong assumptions about the stochastic process that generates consumption. In this context, vulnerability to poverty is defined by predicted poverty, or the likelihood that a household's consumption would fall below a specified poverty level in the near future. Initially assume that the stochastic process that generates a household's consumption is provided by

$$\ln C_h = X_h\beta + e_h \text{---------- (1)}$$

Here $C_h$ is per capita consumption expenditure, $X_h$ represents a bundle of observable household characteristics, such as location, size, and the level of education attained by the head of the household, etc., $\beta$ is a vector of parameters, and $e_h$ is a mean zero disturbance term that captures idiosyncratic factors (shocks) that cause different per capita consumption levels for otherwise observationally equivalent households.

Variance of $e_h$ is given by:

$$\sigma^2_{e,h} = X_h\theta \text{---------- (2)}$$

Then use a viable three-step generalized least squares (FGLS) approach proposed by Amemiya (1977) to estimate β and primarily we use an ordinary least squares (OLS) procedure to estimate equation (2). Equation (1)'s calculated residuals are used to estimate the following:

$$\hat{e}^2_{OLS,h} = X_h\theta + \eta_h \text{---------- (3)}$$

There for in equation (1) where estimated using the ordinary least square (OLS) procedure then, the estimated residual from equation (2) used to estimate, With OLS the equation is changed in the following ways using the predictions from this equation:

$$\frac{\hat{e}^2_{OLS,h}}{X_h\hat{\theta}_{OLS}} = \frac{X_h}{X_h\hat{\theta}_{OLS}}\theta + \frac{\eta_h}{X_h\hat{\theta}_{OLS}} \text{---------- (4)}$$

An asymptotically efficient FGLS estimate$\hat{\theta}_{FGLS}$ is obtained by estimating this modified equation using OLS. It should be noted that the idiosyncratic component of household consumption variation,$\sigma^2_{e,h}$, may be consistently estimated using $X_h\hat{\theta}_{FGLS}$.

The estimation become

$$\sigma^2_{e,h} = \sqrt{X_h\hat{\theta}_{FGLS}} \text{---------- (5)}$$

are then used to change equation (2) in the manner shown below:

$$\frac{\ln C_h}{\hat{\sigma}_{e,h}} = \frac{X_h}{\hat{\sigma}_{e,h}}\beta\frac{e_h}{\hat{\sigma}_{e,h}} \text{---------- (6)}$$

An asymptotically efficient and consistent estimate of β is obtained using OLS estimation of equation (6). By dividing the reported standard error by the regression's standard error, one may determine the standard error of the estimated coefficient, or $\hat{\beta}$ FGLS.

We are able to directly estimate expected to log consumption using the estimations$\hat{\beta}$and $\widehat{\theta}$ that we obtain:

$$\widehat{E}[C_h|X_h] = X_h\hat{\beta} \text{---------- (7)}$$

Household h's vulnerability become

$$\widehat{v}_{ht} = \widehat{Pr}(\mathbf{lnC_{ht}} < ln\ z|X_{ht})\text{---------- (8)}$$

Here $\widehat{v}_{ht}$ signifies household h's vulnerability, $C_{ht}$ means household h's per capita consumption, and z denotes the poverty level (national poverty line or food poverty line) of household consumption. The probability that a family would become poor is determined not just by its predicted (mean) consumption but also by the volatility (i.e., variation from an intertemporal perspective) of its consumption stream. As a result, both estimates (household projected consumption and variation in consumption) are necessary to measure the extent of vulnerability to poverty of a household. Assuming that the data creation process for consumption for household h is covered by the following equation

$$\mathbf{lnC_{ht}} = X_{ht}\,\boldsymbol{\beta} + e_h\text{---------- (9)}$$

Where $\mathbf{C_{ht}}$ denotes per capita consumption for household h, $X_{ht}$ denotes a vector of observable household characteristics such as household size, gender of household head, educational attainment of the head of household, and so on**,** $\boldsymbol{\beta}$ is a vector of parameters, and $e_h$is a mean-zero disturbance term that captures idiosyncratic factors (shocks) that contribute to differential levels of per capita consumption for households with similar characteristics. Household h with attributes $\boldsymbol{X_{ht}}$ vulnerability to poverty may now be determined by:

The dependent variable of the study was poverty status of the household which is dichotomous variable with two outcomes- either poor on non-poor household. Households have been categorized into two categories as poor or non-poor due to the deprivation scores from multidimensional poverty deprivation. Binary logistic regression model is proposed as under

$$\widehat{v}_{ht} = \widehat{Pr}(\mathbf{lnC_{ht}} < ln\ z|X_{ht}) = \boldsymbol{\Phi}\left(\frac{\mathbf{ln}\ z - \mathbf{X_{ht}}\hat{\boldsymbol{\beta}}}{\sqrt{X_{ht}\hat{\boldsymbol{\theta}}}}\right)\text{---------- (10)}$$

The expressed vulnerability to poverty, denoted by$\widehat{\boldsymbol{v}}_{\boldsymbol{h}}$**,** is the probability that the per capita consumption level $\boldsymbol{C_{ht}}$ will be lower than the poverty line (z) conditional on household attributes $\boldsymbol{X_{ht}}$**,** $\boldsymbol{X_{ht}\beta}$, the expected log consumption determined from equation (10).

Meanwhile, $\boldsymbol{\Phi}$ indicates the standard normal distribution's cumulative density and $\sqrt{\boldsymbol{X_{ht}\widehat{\theta}}}$ is the standard error of the error component in (10) and $\boldsymbol{InZ}$ is the log of minimum consumption or income level of household will be vulnerable.

Regression analysis is a central element of the approach used in poverty assessments, which yields varying significance levels. It is reasonable to assume that measurement error or an unobserved factor contributes to the disturbance term. The probability that a household with specific characteristics $\boldsymbol{X_h}$ will fall into poverty is calculated based on this assumption, addressing these two issues. First, it is restrictive because it ignores the possibility that a household with a lower mean consumption may experience greater consumption volatility than one with a higher average level of consumption by forcing the estimates of the mean and variance of consumption to be monotonically related across households. Second, a distorted estimate of the probability that a household is poor results from the standard deviation of the disturbance term directly entering the equation in terms of pure statistics. Although the variance of the disturbance term follows explicitly modeled in some poverty analyses, this step is viewed as a necessary correction for heteroskedasticity and has little further economic significance.

Finally, the regression analysis indicates the correlations associated with vulnerability to poverty. This can help direct policy and confirm the significance of certain factors, as previously noted in the literature

### 3.2.4 Determinant of Vulnerability to poverty

Chaudhuri (2002) introduces a poverty vulnerability index that incorporates the probably of falling in to poverty and expected depth of poverty if it occurs. This index can be estimated using various methods including Ordinary Least Squares (OLS) regression that estimates the parameter of a linear model by minimizing the sum of squared difference between the predicted and actual values of the dependent variable. Azam and Imai (2009) are recognized for using for using OLS to examine determinants of vulnerability to poverty .in order to analyze the determinants that contribute to each household's vulnerability to poverty as expected (VEP) in the study area, the following model is provided

$$\boldsymbol{Y_{ij} = \beta X_i + e_i}$$

$Y_{ij}$ =Estimated vulnerability as expected poverty indices

$X_i$=vector of explanatory variables

$\beta$=vector of respective parameter

$e_i$=error term

### 3.2.5 Estimation Methods of Vulnerability

Chaudhuri et al.(2002) proposes two thresholds for classifying vulnerability to poverty in his study; relative vulnerability and high vulnerability .Households classified as relatively vulnerable if their estimated vulnerability level is higher then the observed poverty rate ,but less then 0.5 . Household are high vulnerability if their estimated vulnerability coefficient is greater then 0.5,to consider a household vulnerable meaning they have a 50% or greater chance of falling in to poverty within the next period ,this threshold corresponds to a significant risk of experiencing poverty by employing these two households . Chaudhuri et al.(2002) distinguishes between different levels of vulnerability with the studied populations .Households exceeding the observed poverty rate but demonstrating a vulnerability level below 0.5 are considered relatively vulnerable compared to those exceeding both the poverty rate and 0.5 threshold, which are classified as highly vulnerable Likewise, two threshold measures will be used in the study.

### 3.2.6 Methods of Data Analysis

The study uses both econometric data analysis models and descriptive tools. Employed are descriptive data analyses, such as percentages, mean values, and variances of household characteristics and other information. To analyze the data of the econometric model used Stata software, and the data will be examined by using a three-stage feasible generalized least squares (3FGLS) technique to determine the degree of vulnerability to poverty among low-income neighborhoods in Addis Ababa city and to characterize the distribution of vulnerability and

poverty in the study area. Further, vulnerability to poverty will be Variable Descriptions and Measurements.

**Dependent Variable:**

**Household consumption Expenditure**: a dependent variable in this study is the natural logarithm of monthly per adult equivalent consumption expenditure. This measure is a key indicator of household welfare and essential for assessing vulnerability to poverty, especially during the initial phase of the Feasible Generalized Least Squares (FGLS) estimation. Household expenditure includes food and non-food expenses, the values in ETB.

The total annual household consumption expenditure (HCEI) includes various spending, by considering the adult equivalent measure or adjusted for household size. The adult equivalent approach for HCEI provides a more accurate reflection of a household's financial well-being and the need for better assessment of vulnerability to poverty, particularly in urban areas.

**Independent Variables:**

1. **Age (agei):** The age distribution of individuals within a household plays a significant role in determining consumption patterns and potential poverty risks. Young children and elderly family members typically require more spending on healthcare and education, which increases overall household expenditures. On the other hand, working-age adults are often income earners who contribute to financial stability. Therefore, the balance between dependents and working adults is a crucial factor in assessing vulnerability to poverty, with households having a higher ratio of dependents facing more financial strain (Li & Li, 2014).
2. **Household size (Hsi):** The number of members in a household usually relates directly to its consumption demands. As household size increases, expenditures invariably increase because large households demand more resources for food, health care, and housing, among other items. The more extensive the household, the greater the financial burden, increasing the probability of falling into poverty (Kiran & Dhawan, 2015; Becker, 1965).
3. **Gender (sexi):** Gender influences household expenditures and economic outcomes. For instance, households with a higher proportion of women may attribute more spending to

health and education costs; conversely, households dominated by men may utilize resources differently. Gender analysis is crucial to determining resource levels and poverty vulnerability. (Bhupal & Sam, 2014).

4. **Educational Level (edui):** The education of the household head, largely determines household poverty. Higher levels of education are generally associated with better job opportunities, indicating a lower risk of poverty. The more educated the household, the less economic distress they experience and the more stable their finances tend to be (Obasi et al., 2020; Similer et al., 2004).
5. **Income (inci):** Household income after taxes is a crucial determinant of financial well-being. A higher income provides more resources for consumption, which improves living standards and reduces the likelihood of poverty. It also enables households to handle economic shocks and invest in long-term financial stability (Gacus, 2021).
6. **Saving status (sssi):** Saving is the act of setting aside money for future use, away from non-immediate uses, which is disposable income. It is important to increase income and help reduce vulnerability to poverty. A higher savings rate protects against unexpected challenges such as illness or job loss. Saving may reduce current consumption give long-term financial security, and lower the risk of poverty (OECD, 2016; Mankiw, 2014).
7. **Marital Status (msi):** It is a categorical variable; the marital status of the household head affects financial stability and consumption expenditure. Married individuals often benefit from pooled resources, which can lead to higher financial stability. Conversely, single, divorced, or widowed individuals may face additional financial pressures. Understanding the impact of marital status is essential in evaluating its role in household economic security and vulnerability to poverty (Sekhampu & Niyimbanira, 2013; Fafchamps & Quisumbing, 2002).
8. **Employment Status (esi):** Employment status of the household head influenced the household's income and economy. Typically, this employment status would ensure more practically reliable income and, in turn, higher overall income for the head of a household, leading to a reduced probability of experiencing poverty. On the contrary, unemployment leads to financial strain and increases vulnerability to poverty (Sugiarto & Wibowo, 2020; Khamis & Reem, 2019).
9. **Exposure to Idiosyncratic Shocks:** It is a continuous variable, proportionate to exposure to idiosyncratic shocks that households face, shocks related to households or individual-level

vulnerabilities such as illness, death, job losses, and other shocks for the past 12 months. These shocks destabilize household finances considerably. The impact of such shocks is worse, especially for low-income households, as this would be a triggering factor for increasing their risk of falling into poverty (Dercon & Krishnan, 2003; Masten & Obradović, 2006).

10. **Access to Electricity:** The household's monthly electricity consumption in kilowatt-hours (kWh) measures this continuous variable. Hence, higher electricity consumption often correlates with better living conditions and access to modern amenities, indicating a higher economic situation. On the other hand, limited access to electricity can signal lower income levels and inadequate infrastructure, both of which contribute to a higher risk of poverty (Nielsen & Petersson, 2021; Lee & Lee, 2020).
11. **Access to Proper Sanitation:** indicates access to sanitation, whereas its facilities meet the minimum hygiene and health standards. Households with healthy sanitation typically avoid health-related financial burdens that could potentially jeopardize their economic position. Poor sanitation increases the chances of diseases, therefore increasing vulnerability to poverty in the household (Bain et al., 2014; WHO, 2015).
12. **Dependency Ratio (adri):** This refers to the proportion of children and older persons who are unable to work, compared to the working-age population. This situation implies a higher level of dependency within the households, as these households impose increased financial pressure on working members who must support an increasing number of dependents. A high dependency ratio is associated with severe consumption deprivation and greater chances of falling into poverty (Ermias et al., 2019; Li et al., 2020).

# CHAPTER 4

# RESULTS AND DISCUSSIONS

## 4.1 Introduction to Results and Discussions

The chapter begins with a detailed overview of the sociodemographic features of the households, offering insight into the composition and demographic trends within the study sample. Key characteristics such as age, gender, marital status, education level, and residential locations to explore lay the groundwork for analyzing household vulnerabilities. Furthermore, this chapter examines household size and dependency ratios, drawing attention to structural factors that affect household financial pressures. The relevant data and descriptive statistics are incorporated; this chapter paints a comprehensive picture of the socioeconomic dynamics in the research area. This analysis links sociodemographic factors to household vulnerability, allowing for a more detailed examination of poverty within the study area.

The chapter begins by summarizing the sociodemographic characteristics of the household following education levels, employment statuses, household sizes, and dependency ratios; the relevant data is incorporated to provide a deeper understanding of the study area.

## 4.2 The Socio-Demographic and Economic Characteristics of Study Area

The socio-demographic characteristics of households in the study area reveal several critical factors, such as age, gender, marital status, and the educational status of the household. According to the data collected from the study area that is explained by table 4.1, over 91 % of these household head belong to the productive age group (18-65) to remind that the percentage indicate only the household head don't include other member of household this essential for fostering economic productivity and stability within the household head, Those mainly responsible for the economic well-being of the household. Gender analysis indicates that male heads constitute 65.2% of the total, compared to 34.8% of female-headed households. However, this does not give a clear image because we did not get an equal number of female and male household heads. Furthermore, marital status is a crucial determinant of household economics,

with 75.7% of heads being married, which may provide additional income support to their households. Although we don't go into considerable detail here, education levels hold significant importance as they impact economic opportunities and the overall well-being of households, followed by divorced (14.2%), widowed(8.2 %), and single (1.9%).

**Table 4.1: Socio-demographic characteristics of household heads in Hachalu Hundesa Zone**

| **Gender of Household Head** | **Freq.** | **%** |
|---|---|---|
| Male | 174 | 65.2% |
| Female | 93 | 34.8% |
| Age of Household Head | Freq. | % |
| 18-65 | 243 | 91% |
| >65 | 24 | 9% |
| Marital Status of Household Head | Freq. | % |
| Married | 202 | 75.7 % |
| Widowed | 22 | 8.2 % |
| Divorced | 38 | 14.2% |
| Single | 5 | 1.9% |

Source: own computation by using survey data, 2024

The above result demonstrates that low education levels and poverty are mutually reinforcing, creating a persistent cycle of disadvantage. Improved education is crucial for breaking this cycle and reducing vulnerability to poverty. Table 4.2 indicates that 17.6% of household heads lack basic literacy skills. The majority, 71.9%, have attained only a primary education, while just 10.5% have pursued secondary or higher education.

Household size significantly impacts societal well-being. The average household size is about 5.5 persons per household, with sizes ranging from one to eleven .

The average dependency ratio of the study area is 0.84. A higher dependency ratio indicates a financial burden on the productive ages of the household to support non-working dependents. But the ratios indicate balanced demographic characteristics because a large proportion of household heads (91%) are in the productive age group, which helps support a relatively moderate dependency ratio of 0.84. This suggests that the working-age population is not overly

burdened by dependents (children and elderly), which signifies a stable, sustainable economic and demographic structure.

Furthermore, Children and elderly household members are unable to contribute economically to household well-being, due to their age and life stage. The above dependency ratio underscores the significant financial burden on employed household members, who must dedicate an income to supporting their dependents. Households with limited resources are also affected (Kabeer, 2002; Moser, 1998).

Higher dependency ratios can heighten the economic burdens on families, especially in urban areas with inadequate job opportunities and low pay. Under such situations, households struggle to meet basic needs due to uneven financial responsibilities among household members. High living costs, limited access to education, and employment opportunities without social safety nets further deteriorate this situation. As a result, households with higher dependency ratios find it difficult to determine in selected areas like health and education, which are the keys to breaking the poverty cycle (Devereux, 2002; Hossain, 2005).

The impact of household size and dependency ratios factors economic pressures on household needs. Policymakers and social programs need to develop a strategy to reduce poverty. Programs and initiatives that aim to help men engage in income-generating activities to improve their economic independence, to provide affordable childcare for women, or to increase educational opportunities for dependents can reduce dependency ratios and support household financial stability (Rakodi, 2002; Kabeer, 2005).

Family structure also plays a crucial role in shaping economic dependency. Larger households with higher dependency ratios may benefit from community support networks, which offer assistance in managing financial obligations. These networks can strengthen family resilience, enabling households to better cope with economic challenges and secure improved long-term outcomes (Moser, 1998).

In conclusion, household size, dependency ratios, and economic dependency underscore the need for comprehensive policy approaches that address the unique challenges faced by families live in poverty.

**Table 4.2: Educational Status and household Size of the Sample Household**

| Educational Level of HHs | Freq. | % |
|---|---|---|
| No formal education | 47 | 17.6 |
| Primary | 192 | 71.9 |
| Secondary | 28 | 10.5 |
| Household Size and Dependency Ratio of Sampled Households | | |
| Average Household Size | 5.4 | |
| Average adult equivalent size | 5.5 | |
| Average Dependency Ratio | 0.8 | |

Source: own computation by using survey data, 2024

**Employment status and Educational Status**

Formal employment includes government or private sector jobs and pensions, where workers typically have contracts and access to benefits. On the other hand, informal employment includes daily wage labor, informal businesses like street vending, and remittances from family members, which are often not regular and lack formal benefits.

Table 4.3 shows that Individuals encounter challenges in the labor market, and while those with primary education have a better employment outlook, the majority still find themselves in the informal sector. The situation dramatically improves for those with secondary education, with only one individual informally employed and 27 HHS securing formal employment, demonstrating the significant enhancement of job prospects and increased chances of securing stable employment. The survey of 267 household heads revealed an alarming informal employment rate of approximately 66.6%, suggesting that the households in the study area were facing economic challenges. Households with higher education are more likely to work in the formal sector, which usually pays better. But households with lower education remain

predominantly in informal employment, limiting their economic mobility. Addressing educational disparities is crucial to improving job opportunities and promoting economic mobility for households in informal employment.

**Table 4.3: Educational Status vs. Employment status**

| Education status | Informal Employment | Formal Employment | Total |
|---|---|---|---|
| **No formal Education** | 46 | 1 | 47 |
| **Primary** | 131 | 61 | 192 |
| **Secondary** | 1 | 27 | 28 |
| **Total** | 178 | 89 | 267 |

Source: own computation by using survey data, 2024

**Resettlement and Housing Security in the Hachalu Hundesa Zone**

Sheger City—which includes the Hachalu Hundesa Zone—is part of the ongoing urban expansion of Addis Ababa. With rapid population growth and the need for infrastructure development, the Ethiopian government has undertaken several resettlement programs to manage the pressure on the city's existing infrastructure and offer better housing options to low-income and displaced households (Tadesse & Gebremedhin, 2020). These resettlement efforts have been particularly notable due to displacement caused by urban expansion projects and infrastructure development and conflicts, particularly between Oromo and Somali communities. The Hachalu Hundesa Zone is one of the focal points of these efforts, where communities displaced by urbanization and ethnic conflict have been resettled (Yntis, 2021).

The Hachalu Hundesa Zone (within the larger Sheger City) consists of sub-zones that face varying level of socio-economic challenges. The zone includes areas like Bakelcha Bari, Biftu Shaggar, Odaa Shanan, Geda Shanan, Horte Kush, and Tokumma Shaggar, which are particularly affected by resettlement and displacement. Tokumma Shaggar households restated due to the Pisa Corridor Development Project, a major urban initiative that displaced several residents. The resettlement period for these households is relatively short, ranging from 1 to 5

years, moved due to urban corridor projects. These resettled communities often face difficulties in social integration and accessing livelihoods, as many people have moved from rural environments or informal urban settlements into new, inadequately serviced areas (Yntis, 2021).

Regarding the length of residency, many households have resided in the Hachalu Hundesa Zone for 6 to 10 years. This period aligns with the consequences of the Oromo-Somali conflict, during which many households died due to ethnic violence and territorial disputes between the Oromo and Somali communities. While resettlement areas for these displaced households serve as a refuge from the ongoing ethnic tensions.

Regarding housing tenure (based on a survey of 267 households), all households in the area own their current dwellings, and they were resettled through government programs, which provided them with permanent housing. Only two households are renting their current homes, and there are no squatter settlements in the area, as the displaced households were given government housing through official resettlement programs.

Lastly, in Tokumma Shaggar, all households share a single toilet facility, which shows the lack of adequate infrastructure in the resettled area. This situation makes life even harder for displaced communities, as the households live under conditions of limited access to basic services. The shared toilet facility is a significant indicator of the ongoing housing insecurity and service inadequacies that resettled households must cope with.

### 4.2.1 Utility and Service Access

#### Water Electricity and basic Service Availability

The study area reveals significant disparities in the availability of water and electricity, two essential components for home welfare and quality of life. From the data 27.3% of 'non-poor' households have better electricity service, while 87.4% of 'poor' households face limited service. This disparity indicates that poor households often struggle with unreliable electricity, using it only for lighting rather than cooking or other household needs. The fact that approximately 300 households share three phases electrical power for lighting one bulb per household, and most use it for cooking charcoal, exacerbates this limited service. The problem of insufficient water and electricity reduces opportunities for income-generating activities, education, and overall productivity.

The households must be located within the recommended 500-meter distance from water sources (UNICEF, 2015), whereas in the study area, this is not practically applicable, and inconsistent supply and poor water quality continue to insufficient service. Due to the above reasons, the households are affected by those who often cannot collect water themselves. As a result, these households have insufficient utility services and frequently rely on paid water-carrying services, placing additional financial pressure on already strained budgets.

Insufficient utility services contribute to social and economic inequality, especially in households that live in poverty, which is a financial burden.

**Table 4.4: The distribution of electricity distribution of according to poverty status**

| Electricity | No | | Yes | | Total |
|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | |
| Non-Poor HHs | 125 | 72.7% | 47 | 27.3% | 172 |
| poor HHs | 83 | 87.4% | 12 | 12.6% | 95 |
| Total | 208 | 77.9% | 59 | 22.1% | 267 |

Source: own computation by using survey data, 2024

Moreover, increased service availability could enable households to break the cycle of poverty, as service to essential utilities is a cornerstone of sustainable development (Kabeer, 2005; Hulme & Mosley, 1996) utility electricity services in the study area are critical for households that need improvement.

## 4.3 Poverty Line Determination for the Study

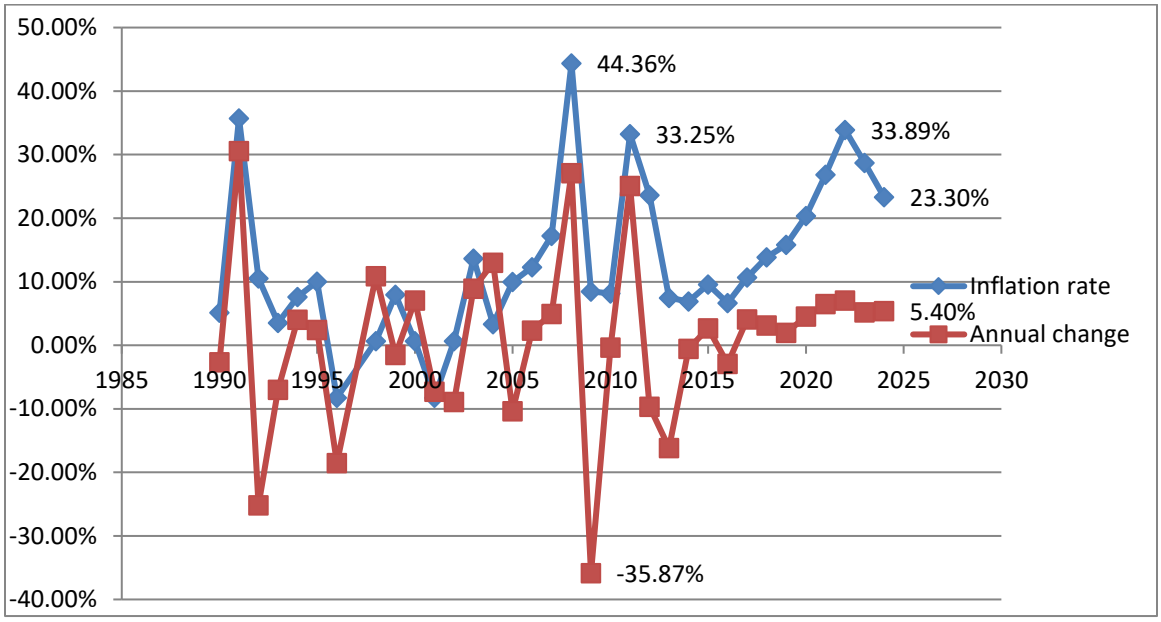
The poverty line is an essential benchmark for distinguishing between poor and non-poor households based on their capacity to achieve a minimum living standard. This study established the poverty line by linking national standards with localized adjustments for Ethiopia's unique economic conditions, including inflation.

This study established the poverty line by integrating national standards with localized adjustments for Ethiopia's unique economic conditions, including inflation.

According to the above, world bank suggest National poverty lines are one of the estimates of poverty, and are consistent with a country's specific economic and social conditions. Poverty lines are estimated in other developing countries by the cost of a food bundle plus an allowance for non-food spending. National poverty lines should be adjusted for inflation between survey years to ensure accurate comparisons of poverty levels over time. Poverty lines indicate the costs of purchasing food and non-food items. The poverty line is affected by price changes. The national poverty lines estimated for Ethiopia in 2016 were ETB 7,184 for total absolute poverty and ETB 3,781 for food poverty. These specific poverty lines measure the minimum acceptable standard of living in Ethiopia. These values are, however, the ones for that year and need to be updated to incorporate inflation in the cost of living over time. Based on inflationary adjustments over the past decade, Ethiopia has faced an average annual inflation rate of 18.96% for the specific period (2016–2024), a more conservative average annual inflation rate of 3.8% has been calculated and applied to adjust the poverty thresholds, indicating the condition of purchasing power According to the World Bank (2022), inflation-adjusted poverty thresholds provide a more realistic measurement of poverty levels (Ravallion & Bidani, 1994). The importance of updating poverty lines for macroeconomic changes, to ensure that poverty estimates remain

consistent over time, is to better reflect the real cost of living. Regular adjustments of poverty lines to reflect inflationary pressures in its reports (CSA, 2023)

**Figure 4.1: Trend of Ethiopia Average Annual Inflation Rate from 1990 to 2024**




Source: World Bank via FRED and Macrotrends

Using the above available data, we can calculate an average inflation rate from historical data between 2016 and 2024 to estimate the national poverty line for 2024.This rate provides a simplified basis for estimating annual increments in the poverty line.

The compound growth formula was applied to calculate the impact of this inflation over the 8-year period. The formula for adjusting the poverty line is as follows:

Adjusted Poverty Line=Initial Poverty Line$\times(1+r)^n$

Where:

- r is the annual inflation rate (3.8% or 0.0376),
- n is the number of years (8 years),

- Initial Poverty Line is the value in 2016 (ETB 7,184 for total absolute poverty and ETB 3,781 for food poverty).

Using this method, the growth factor over the 8 years is approximately 1.34, resulting in the following 2024 poverty lines (ETB 9,652 for total absolute poverty and ETB 5,080 for food poverty The approaches applied with international best practices, particularly those specified by the World Bank (2018), highlight the need to update poverty lines periodically to reflect changes in the inflation rate and cost of living. Similarly, Ravallion et al. (1991) advocate that poverty lines ought to be adjusted to preserve purchasing power over the long term. In Ethiopia, the same techniques are regularly applied to modify poverty lines in a way that makes them relevant to the economic conditions of the country (Hill & Tsehaye, 2014).

Therefore, Ethiopia's average annual inflation is 18.96% over 10 years, and the average annual change of inflation is 3.8%. By using the growth factor formula, the estimated daily poverty line is 26.4 Birr per day per adult equivalent. Particularly in developing countries like Ethiopia, inflation significantly impacts household purchasing power. Therefore, Poverty lines adjusted for inflation are critical for accurate poverty measurement.

### 4.3.1 Poverty Incidence, Depth and Severity

In this section researcher examines poverty depth, Incidence, and Severity based on the F-G-T approach. The categorization is based on a poverty line set using national standards, adjusted for inflation. For this study, the poverty threshold is defined as 26.4 birr per day. The annual household consumption data, adjusted for variations in Adult Equivalent and composition.

In this research, three different types of poverty indexes exist:

$$\boldsymbol{p_{\alpha}} = \sum_{\boldsymbol{i=1}}^{\boldsymbol{q}} \frac{\boldsymbol{z - y_i}}{\boldsymbol{z}}^{\boldsymbol{\alpha}}$$

- $P_{\alpha}$ = FGT poverty measure

- Z = Poverty line
- $y_i$ = Income of individual i (below the poverty line)
- N = Total population or sample is 267
- q = Number of people below the poverty line=95
- α= Sensitivity parameter Where 0,1,2

1. **Head Count** $\boldsymbol{p_0 = \sum_{i=1}^{95} \frac{z-y_i}{z}^0 = \frac{95}{267}}$ **=0.35581** indicated the incidence of poverty in the zone is considerable (35.6%). q denotes the total number of impoverished households, and N stands for the total sample size.

The value of p0≈0.35581 indicated the incidence of poverty in the zone is considerable (35.6%). q denotes the total number of impoverished households, and N stands for the total sample size. The value of p0≈0.35581 implies that around 35.6% of households in the Hachalu Hundesa Zone are categorized as poor, living below the established poverty threshold.

2. **Poverty Gap** $\boldsymbol{p_1 = \sum_{i=1}^{95} \frac{z-y_i}{z}^1 \frac{33.9}{267}}$**=0.12702**, the poverty gap is 12.7%, while the average poverty gap is 32.4 birr. This implies that to what extent the poor are far from the poverty line, indicate POVERTY depth.

The result $p_1$≈0.12702 indicates that the average poverty gap is approximately 12.7% of the poverty line. This means that, on average, the poor households in the Hachalu Hundesa Zone are about 17.9% below the poverty line in terms of their income or consumption.

- Total households: 1854
- Minimum household size: 5.4
- Sample size: 267

Based on the minimum household size and the sample size, you've estimated the total population to be 10,099. This computation assumes that average household size in this representation is representative of the entire population.

$$\sum z_i - y_i$$=327,340 (yearly expenditure data)

- Sample size= 267
- Total population=10,099

APG = (1/N) * $\sum z_i - y_i$ ≈ (1/10099) * 327,340≈ 32.4

TPG = APG * N

TPG = 32.4* 10099 ≈ 327,340

3. **Severity Gap ($P_2$) =$p_2 = \sum_{i=1}^{q} \frac{z-y_i^2}{z}$=$\frac{13.73474}{267}$=0.051441** this not only number of household i= 1 poor and extent but also it shows severity of the poverty (poorest of the poor). z = poverty line, $y_i$= consumption expenditure of the poor i=1, 2, 3… q and N= total sample size.

The value of $P_2$ ≈0.051441 suggests that the depth of poverty among those living in poverty in the Hachalu Hundesa Zone is about 5.1 % of the poverty line. The result indicates of the proportion of the population below the poverty line and the intensity of their deprivation. It shows how far the poorest households are from meeting their basic needs.

**Table 4.5: Summary of Poverty Indexes**

| **Head Count ($p_o$)** | **Poverty Gap ($P_1$)** | **Severity Gap ($P_2$)** | **Annual Total poverty gap(TPG)** | **Average poverty gap(APG)** |
|---|---|---|---|---|
| 35.6% | 12.7% | 5.1% | 327,340 | 32.4 |

Source: own computation by using survey data, 2024

The data in the table 4.5 above clearly indicates a high percentage of poverty in the zone. With headcount poverty rate of 35.6% a significant proportion of the population lives below the poverty line. The poverty gap is measured at 12.7%, showing the average shortfall in income, while the severity of poverty stands at 5.1%, showing the depth of deprivation among the poorest households. The total annual poverty gap (TPG) is 327,340 birr, and the average poverty gap (APG) is 32.4 birr per individual.

Finally, around 17.9 % of the population cannot meet their basic needs. The poor household's average annual shortfall in consumption expenditure is 26.4 birr. This means that, on average, an extra 32.4 birr per person per year would be needed to bring them up to the poverty line.

### 4.3.2 Poverty Intensity and Distribution

Intensity and distribution of poverty are vital indices for understanding the complexity of urban poverty in the Hachalu Hundesa Zone. The index of poverty gap (P1) measures the average shortfall in consumption expenditure in the poverty line, which is 35.6%, showing the poverty level and the severity of deprivation among the population below the poverty line. The second index of poverty severity estimates 5.1%, indicating the extreme economic hardship experienced by those living in poverty, as their experiences vary significantly from financial suffering. A headcount ratio of 35.6% suggests that households live in poverty, indicating the urgent need for interventions. The average annual poverty gap for all impoverished individuals stands at birr 32.4. The poor person has to get this much more on average to reach the poverty line.

The poverty level is unequal across households, as indicated by a headcount ratio of 53.93%. Unfortunately, most of society lives in poverty, necessitating targeted intervention efforts. The annual average poverty gap is 32.4 birr, indicating that, on average, each impoverished individual requires this additional amount of birr to reach the poverty line.

Household size and dependency ratio also influence the distribution of poverty. Larger households, or those with more dependents, tend to experience higher poverty levels, as their limited resources must support more individuals.

### 4.3.3 Poverty Status and Income, consumption and saving

The study's methodology integrates comprehensive data on food and non-food consumption with household saving ability to examine an understanding of economic stability and the factors that expose households to poverty.

Table 4.5 focused on household consumption of food and non-food items to analyze vulnerability to poverty from monthly consumption expenditures per adult equivalent and identify patterns that may indicate varying poverty levels. The study also analyzes the household savings ability to serve economic challenges.

When the monthly income of households living below the poverty line is insufficient to fulfill basic needs

Therefore, essential food and non-food consumption provide insight into poverty status households.

**Table 4.6: Monthly per adult equivalent consumption for food and non-food items, measured in Birr**

| Variable | Obs | Mean | Std.dev | Min | Max |
|---|---|---|---|---|---|
| Monthly consumption food | 267 | 1,946.3 | 1483 | 219.9 | 10,220 |
| Monthly consumption non-food | 267 | 477.8 | 515.7 | 14.0 | 4,789 |
| Total | 267 | 2,424.0 | 1,915.4 | 233.9 | 15,009 |

On average, food expenditures amount to 1,946.3 birrs with a standard deviation of 1483 birrs, indicating substantial variation in household spending. The lowest reported food 5 Household food expenses consume a greater portion of the budget compared to non-food consumption

The socioeconomic factors that influence income and economic vulnerability to poverty

- High Dependence on Food Expenses
- Low Saving states: Of households, 92.9% have no savings, leaving them unprepared for sudden expenses or economic shocks. As a result, these families are more likely to fall into deeper poverty. This lack of financial resilience underscores the need to promote savings programs and improve sources of income among households.
- Implications for Poverty Alleviation Policies: The results of this analysis suggest the need for targeted interventions that increase incomes (and consumption) and promote savings to responsible consumption behavior. Need to improve access to financial services like savings accounts and microfinance programs, can help households build an income cushion that reduce their exposure to poverty.

In contrast, the average monthly expenditure on non-food items is notably lower at 14 birr, with a standard deviation of 515.7 birr. The recorded minimum value of non-food spending is 14 birr, suggesting that certain households struggle to afford essential non-food items such as health care, education, transport, and other essential services. The distinction between food and non-food consumption highlights the fact that food takes priority in household budgets, leaving limited room for other essential items.

**Table 4.7: Household Savings Status**

| Saving | Freq. | % | Cum. |
|---|---|---|---|
| No | 248 | 92.9 | 92.9 |
| Yes | 19 | 6.1 | 100.00 |
| Total | 267 | 100.00 | |

Source: Own estimation

The table indicates that 92.9% of households reported having no savings, and 6% have a habit of savings ranging from 50 to 200 birr per month, whereas without savings other unexpected shocks such as unemployment and health issues increase cycles of poverty.

Household spending patterns show a high priority on food consumption, emphasizing the focus on basic needs. Conversely, low expenditure on non-food items suggests limited capacity to

invest in services that could improve overall well-being. Without a culture of saving, unexpected life events can further entrench.

## 4.4 Coping Mechanisms of Household Poverty

This study examines the poverty status of these households and their coping mechanisms. The households living below the poverty line earn less than what is required to meet their basic monthly needs. The strategies of coping mechanisms need to gather information on food and non-food consumption and then assess their ability to cope with poverty (Chambers, 1989; Devereux, 1993).

**Table 4.8: Poverty status of the households**

| Poverty status | Freq. | % | Cum. |
|---|---|---|---|
| Poor | 174 | 65.2 | 34.8 |
| Non-poor | 93 | 34.8 | 100.00 |
| Total | 267 | 100.00 | |

Source: Own estimation

The table shows that 34.8% of households fall below the poverty line and need supplemental income sources to meet their essential needs, as their current income is inadequate to cover basic living expenses (Rakodi, 2002; Moser, 1998). Studies show that low-income families in cities frequently employ different coping methods to handle financial strains, including borrowing from social networks, cutting down household expenses, or seeking extra employment (Kabeer, 2002; Hossain, 2005). Analyzing these coping strategies provides a focus on poverty reduction initiatives in urban areas.

## Coping Mechanisms: Common Strategies for Mitigating Poverty

This section details the specific methods households use to address financial hardship. The households use informal borrowing from well-off friends, household members, or the

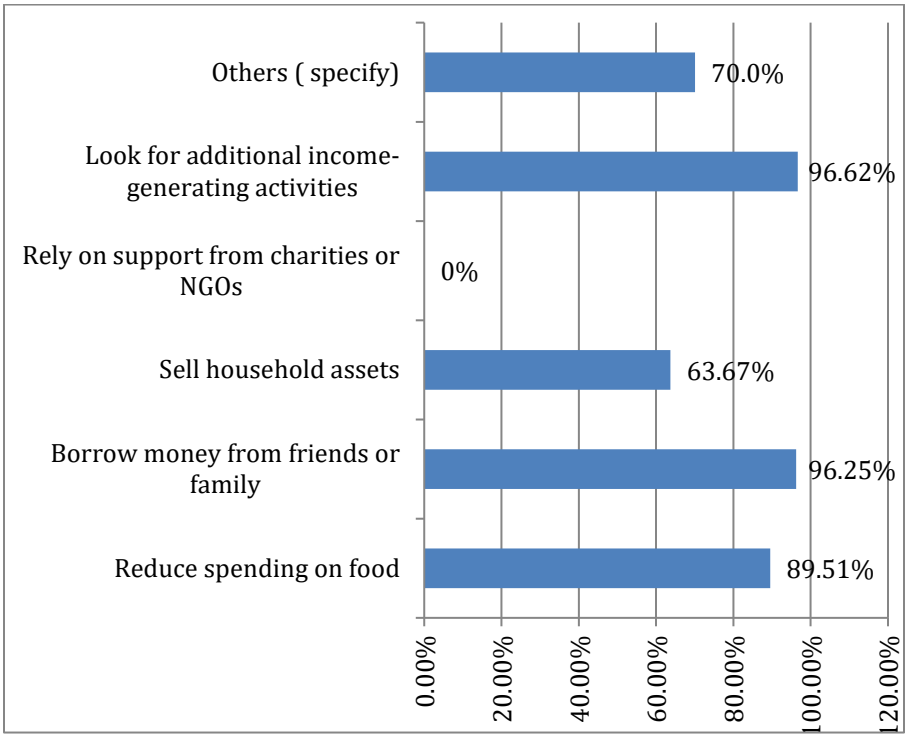
community to supplement income-generating activities like wage employment in the informal and street vending.

## 4.5 Households' Coping Strategies for Poverty

Figure 4.1 presents the coping strategies of 267 urban households facing financial challenges. A significant 96.3% rely on borrowing money from friends or family, reflecting a strong dependence on social networks. This aligns with studies suggesting that urban households often turn to informal social support to manage financial stress (Rakodi, 2002; Moser, 1998). Similarly, 96.6% of households engaged in additional income-generating activities and took advantage of urban job opportunities to increase their earnings (Kabeer, 2002). Reducing food expenses means finding ways to spend less on food without sacrificing nutrition or quality. Reducing food expenses was another common strategy adopted by 89.5% of households, highlighting the sacrifices made in essential consumption to cope financially, a strategy often observed in urban poverty contexts (Devereux, 1993). About 63.7% of households chose to sell household assets, providing temporary relief but potentially weakening future resilience (Hossain, 2005). Additionally, 70.0 % of households reported using other unspecified strategies, suggesting various adaptive methods. Notably, none of the households relied on charity or NGO support, which could be attributed to cultural preferences or limited aid availability, as observed in other urban poverty studies (Krause & Reeves, 2017).

Finally, these findings indicate that urban households prioritize borrowing, seeking additional income, and cutting expenses over seeking external support, underscoring the need for accessible, formal assistance in urban poverty relief programs.

**Figure 4.2: Household coping strategies for poverty**




Source; own computation using survey data (2024)

### 4.5.1 Household Poverty and Government Support

The government support examines mechanisms available to households below the poverty line, highlighting various initiatives to reduce financial burdens and improve economic stability. Skills training programs is the most widely applicable form of assistance, with 63.5% of households (169 households) participating in these initiatives. Such programs or skills are important for income-generating activities, reducing dependency, and fostering long-term financial resilience (Kabeer, 2005; Moser, 1998).

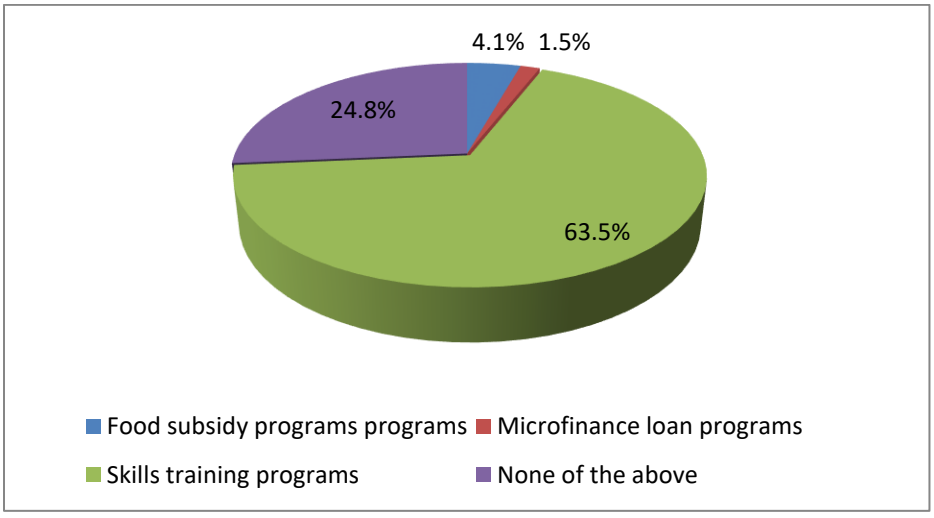
Food subsidy programs, reaching 4.1% of households (11 households), provide an essential safety net for those struggling to afford necessities. These subsidies help mitigate food insecurity and ensure vulnerable populations have access to sufficient nutrition, especially vital in urban areas where food costs can be high (Devereux, 2002). Further, 1.5% of households (4 households) get access to microfinance loans, suggesting limited loan opportunities. Researchers

say that microfinance loans are used for small businesses and household improvement, and poverty alleviation by increasing income opportunities (Morduch, 1999; Hulme & Mosley, 1996).

According to the study, 24.8% of households (66 households) do not have any of these government support options, possibly due to a lack of awareness and opportunity. This gap points to the need for enhanced outreach efforts and improved outreach strategies.

Government support programs are essential for reducing poverty by enhancing household financial security and economic stability. High participation in skills training programs suggests they are accessible and perceived as valuable, often leading to improved job opportunities. However, concerns remain about the long-term stability these programs provide. In contrast, low engagement with food subsidies and microfinance loans points to barriers such as limited awareness or access. In the study area, no food subsidies indicate households do not adequately address chronic food insecurity. These findings underscore the need for more comprehensive and accessible support systems to reduce poverty in the long term.

**Figure 4.3: Household's poverty and government support**




Source; own computation using survey data (2024)

## 4.6 Econometric Analysis

### 4.6.1 Overview of Econometric Methods

Econometric analysis explores the interrelationships between various sociodemographic and economic variables and their impact on household consumption. This section discusses the econometric techniques used to examine the spending patterns of individuals in the Hachalu Hundesa Zone. These methods include ordinary least squares (OLS) regression, robust standard errors for testing data reliability, and feasible generalized least squares (FGLS) econometrics.

The data arrangement, the study's objectives, and potential estimation issues guide the choice of the analysis techniques. The researcher chose OLS regression to examine the relationship between the independent and dependent variable, household expenditure. OLS has limitations when heteroskedasticity (non-constant variance of errors) or autocorrelation (correlation of errors across observations) is present. These issues can lead to biased standard errors and incorrect conclusions. Robust standard errors complement OLS regression to ensure the reliability of results.

The researcher incorporates robust standard errors to account for potential heteroskedasticity, resulting in more accurate standard errors that better reflect the variability of the data. This adjustment ensures an accurate assessment of predictor variable importance by using robust standard errors when homoskedasticity is violated.

In addition, the researcher employed FGLS to correct for any heteroskedasticity and autocorrelation in the error terms, further improving the estimates. This method is advantageous for cross-sectional data, enhancing the accuracy of estimates and enhancing the reliability of inferential statistics. Furthermore, FGLS determines the level of vulnerability of the household.

### Measuring Vulnerability Using the Outcome Approach

Consistent with the broader literature on poverty and vulnerability measurement, this study adopts the Outcome Approach to assess vulnerability to poverty. This approach focuses on the probability of experiencing poverty in the future (Chaudhuri, 2001; Chaudhuri, Jalan, &

Suryhadi, 2002; Azam & Imai, 2009). Unlike utility-based methods, which compare a household's certainty in consumption with expected utility (Ligon & Schecter, 2003, 2004), the outcome approach uses observable household characteristics to predict the likelihood of falling below the poverty line.

The study models vulnerability using cross-sectional data, assuming that observable household characteristics explain variations in per capita consumption. To estimate vulnerability the researcher employs a two-step regression approach, using weighted least squares to estimate residual variance. This method estimates how likely it is that a household's consumption per person will be lower than the poverty line.

The model includes log per capita consumption and household characteristics, such as household size, education level...etc. This study helps identify key factors contributing to household vulnerability, allowing to estimation of future poverty risks.

By combining OLS regression, robustness checks, and FGLS, the study offers reliable and accurate estimates of the relationships between socioeconomic variables and household expenditure. The Outcome Approach also enables a comprehensive measure of vulnerability, providing valuable insights into the risk of future poverty based on observable household characteristics.

### 4.6.2 Robustness Check with Linear regression (Robust Standard Error)

The researcher conducts a robustness check by employing linear regression with robust standard errors, to improve the reliability of the regression outcomes. This method addresses potential issues of heteroskedasticity, ensuring that the standard errors remain unbiased and accurately capture the variability present in the data. By using robust standard errors, we can more accurately judge the importance of the predictor variables and confirm the relationships found in the first analysis, even if we make different assumptions about the error variance. This additional check signifies the study conclusions concerning the determinants of household expenditure in the Hachalu Hundesa Zone.

**Table 4.9: Linear Regression Results ( Robust.Std. Err)**

| Log Expenditure | Coefficient | Robust std. err. | t statistic | P value |
|---|---|---|---|---|
| Household size | -.0845704 | .0083671 | -10.11 | 0.000*** |
| Gender | .1136182 | .041557 | 2.73 | 0.007*** |
| Age | -.00302 | .0014897 | -2.03 | 0.044** |
| Dependency Ratio | .0896888 | .0355065 | 2.53 | 0.012** |
| Marital status | .0677774 | .0309436 | 2.19 | 0.029** |
| Educational status | -.1087594 | .04294 | -2.53 | 0.012** |
| Employment status | .1252036 | .0469364 | 2.67 | 0.008*** |
| Electricity Access | .1167297 | .0463428 | 2.52 | 0.012** |
| Saving | .2544563 | .0598888 | 4.25 | 0.000*** |
| Health status | .1201704 | .040131 | 2.99 | 0.003*** |
| Idiosyncratic Shock | -.0738206 | .0188394 | -3.92 | 0.000*** |
| _cons | 4.994762 | .1604252 | 31.13 | 0.000 |
| Number of Obs=267 | | R-squared=0.04470 | | |
| F(11, 255) =26.86 | | Root MSE=0.315 | | |
| Prob > F=0.0000 | | | | |

Note: *, ** and *** refers to Significant at 10%, 5% and 1% Significant level respectively

**Source**: Own estimation (2024)

The researcher conducted a linear regression analysis on household expenditure in the Hachalu Hundesa Zone, which provides valuable insights into the socio-economic determinants of urban poverty of 267 observations, the model robustness, with an F-statistic of 26.86 and a p-value of 0.0000, indicating that at least one of the predictor variables has a critical effect on household spending. This significance illustrates the model and catches correlations between major socio-economic parameters and household expenditure.Due to several factors, all variables are statistically significant. First, the data was collected from low-income households that showed similar living conditions, which reduced variation. Secondly, multicollinearity was not an issue, as verified by low VIF values. These combined factors explain the consistent significance across variables.

The model interprets the change in household expenses with an R-squared value of 0.04470, which is 4.47% percentage is relatively low, suggesting that other unobserved factors also influence household expenditure. However, the statistical significance of individual predictors remains useful. The Root Mean Square Error (Root MSE) of 0.315 reflects the model's prediction accuracy, with a moderate deviation from actual expenditure observations.

As household size increases, per capita expenditure decreases due to resource dilution and shared consumption. A higher dependency ratio, however, is linked to higher per capita expenditure, suggesting that more dependents lead to increased household costs. Both factors highlight the balance between household resources and needs. A higher dependency ratio is associated with higher per capita household expenditure, suggesting that households with more dependents have fulfilled basic needs. However, it could also indicate financial strain that affects per capita consumption quality.

Additionally, the analysis demonstrates a positive correlation between increased expenditure and marital status. Married households may spend more due to combined income, shared responsibilities, and higher family obligations, such as childrearing and household maintenance.

Conversely, age has a negative but significant impact on household expenditure, with older household heads typically exhibiting lower expenditure levels. Thus elderly households need to be supported, ensuring they have sufficient income to maintain a decent standard of living.

The households employed can spend their income and live better. As a result, emphasizes the necessity for policies to help increase employment for all people and make their current jobs more secure.

Access to electricity is associated with higher expenditure, possibly due to increased access to services that enhance quality of life. All those suggested the need for infrastructural developments to get electricity.

This regression analysis demonstrates the complexity and interdependence of the factors influencing household expenditure in the urban fringes, including household size, employment

status, dependency ratio, and access to essential services like electricity. Supporting vulnerable household's needs government intervention to improve access to electricity and promote employment opportunities. Which helps reduce poverty and enhance household welfare. Additionally, investments and infrastructure improvements contribute to long-term poverty reduction.

### 4.6.3 Determinant of vulnerability to poverty

The FGLS first-stage model analyzes the household vulnerability to poverty using the natural log value of per-adult-equivalent household consumption expenditure as the dependent variable. This approach allows you to account for potential issues of heteroskedasticity and autocorrelation in error terms, providing more reliable estimates of the relationships between your dependent and independent variables.

Based on the FGLS estimation results presented as determinants of vulnerability to poverty in Table 4.16, the analysis identifies several key determinants of vulnerability to poverty in the study area.

**Table 4.10: Determinants of Vulnerability to poverty by FGLS Estimation**

| Log Expenditure | Coefficient | Std. err. | t- statistic | P value |
|---|---|---|---|---|
| Household size | -.0843767 | .0085361 | -9.88 | 0.000*** |
| Gender | .1135876 | .0420298 | 2.70 | 0.007*** |
| Age | -.0030247 | .001543 | -1.96 | 0.051* |
| Dependency Ratio | .0942067 | .0350682 | 2.69 | 0.008*** |
| Marital status | .0681586 | .0294165 | 2.32 | 0.021** |
| Educational status | -.1089465 | .043127 | -2.53 | 0.012** |
| Employment status | .1285312 | .0486002 | 2.64 | 0.009*** |
| Electricity Access | .1167382 | .049795 | 2.34 | 0.020** |
| Saving | .2602448 | .0879764 | 2.96 | 0.003*** |
| Health status | .1194128 | .0410431 | 2.91 | 0.004*** |
| Idiosyncratic Shock | -.0742915 | .018322 | -4.05 | 0.000*** |
| cons | 4.990526 | .151475 | 32.95 | 0.000*** |

| | |
|---|---|
| Numberof obs=267 | R-squared=0.4418 |
| F(11, 255) =18.35 | Adj R-squared=0.4177 |
| prob> F=0.0000 | Root MSE=0.31739 |
| Sum of wgt is 62.2796254605549 | |

Note: *, ** and *** refers to Significant at 10%, 5% and 1% Significant level respectively

**Source**: Own estimation (2024)

Household size shows a negative coefficient relationship with consumption, indicating that household size increases and then reduces per capita consumption due to low income. This result is line with the findings of Lanjouw & Ravallion (1995).

Gender also significantly influences consumption. Female-headed households face economic challenges compared to male-headed households due to limited opportunities employment options, lower wages, and low access to credit or savings programs. These reasons contribute to greater financial vulnerability and lower savings rates. This result is consistent with the findings of (Ermias et al., 2019).

Age of household head is a significant factor, negatively associated with consumption, with each additional year of age leading to a slight reduction in consumption, as older individuals may face income constraints and fewer opportunities for income generation (Obasi et al., 2020). A higher dependency ratio places a financial burden on working-age adults in the household, leading to lower consumption and significant, the Findings related to (Li et al., 2020).

In contrast, the marital status of household heads positively correlated to consumption, with married individuals generally experiencing higher consumption due to pooled resources, supporting previous research on the economic benefits of marriage (Lundberg & Pollak, 1993). Educational status shows a negative relationship with consumption, suggesting that individuals with higher education may prioritize saving over immediate consumption. This finding is closely related to Attanasio and Deaton (2002). Employment status positively influences consumption, with employed household heads having more income and, consequently, higher consumption

(Sugiarto & Wibowo, 2020). Electricity access significantly increases consumption, as households with electricity are better equipped to improve their living standards and productivity, this finding of Nielsen & Petersson (2021). Savings also boost consumption, as households with a habit of savings have more financial security, allowing for greater consumption without depleting resources, reinforcing the findings of the OECD (2016).

Health status was positively correlated with consumption, indicating that healthier households can consume more due to fewer healthcare expenses and higher income potential (Masten & Obradović, 2006). Then, exposure to idiosyncratic shocks is significant, which reduces consumption. Unexpected events, such as economic or health-related shocks, disrupt household income and force households to reduce spending. This result is the findings of Dercon & Krishnan (2003).

Finally, the choice of a vulnerability threshold, a minimum level of vulnerability above which all households below the poverty threshold are defined as vulnerable, and the time horizon is necessary for assessing household vulnerability to poverty status. And these decisions involve a certain degree of arbitrariness. Chaudhuri (2003) adopted a vulnerability threshold of 0.5, the most preferred vulnerability threshold, and the time horizon is necessary. Households are considered as vulnerable if they have a 0.5 or higher probability of falling into poverty at least once in the next year. The findings, based on FGLS-calculated vulnerability level, reveal that 99.8% of almost all households are classified as vulnerable, with many exceeding the 0.5 threshold, underscoring the urgent need for targeted interventions to address the specific factors contributing to vulnerability—such as improving access to education, employment opportunities, and financial services—while simultaneously building resilience to economic and health shocks.

### 4.6.4 Diagnostic plots and Model Fit

The provided QQ plot indicates that the data does not conform to a perfectly normal distribution. While the central portion of the data points aligns reasonably well with the diagonal line, there are noticeable deviations in the tails, particularly the heavier ones. These deviations suggest that the data might have a greater spread than a normal distribution would predict. Such discrepancies often imply that the data may not follow a Gaussian (normal) distribution, which is a key

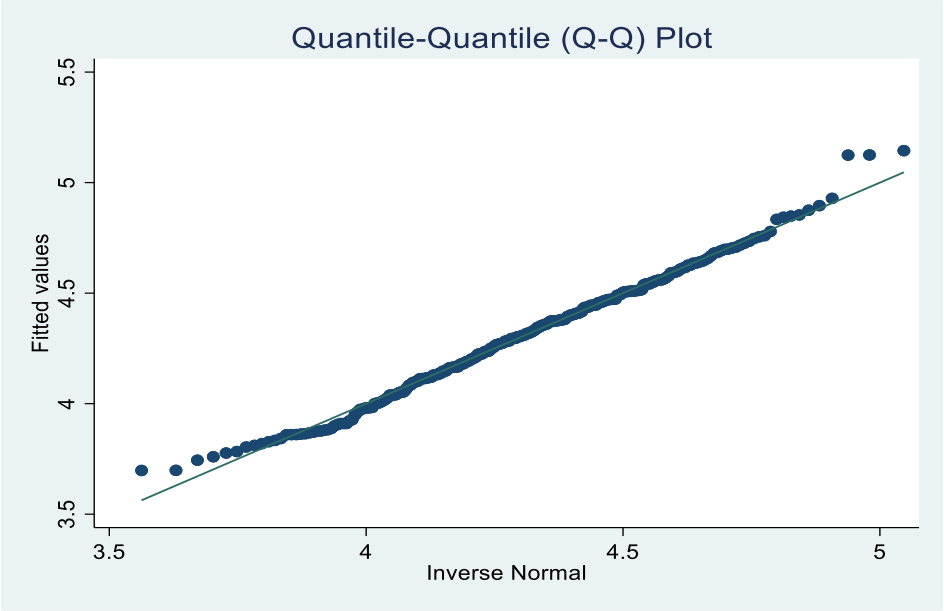
assumption in many statistical models. Researchers use extra tools, like histograms and more formal statistical tests, like the Shapiro-Wilk test or the Anderson-Darling test; to carefully check the assumptions behind the distribution (Deaton & Zaidi, 2002).

Another issue with the suggested model is heteroskedasticity, which refers to the error term's variance varying across observations. This phenomenon leads to inefficient parameter estimates in ordinary least squares (OLS) regression, thereby compromising the reliability of inferences. Building a variance-covariance matrix that addresses heteroskedasticity is a good way to deal with this, which FGLS makes possible. This would lead to more reliable estimates (Wooldridge, 2010). It guarantees a more appropriate accounting of the model's error variance, leading to more reliable and accurate results.

FGLS can also fix errors with autocorrelation or serial correlation by using a generalized least squares estimator that takes into account how error terms correlate across observations. Time series data heavily relies on autocorrelation, as these observations typically exhibit a strong correlation over time. With cross-sectional data, on the other hand, serial correlation can occur due to unknown factors that affect the dependent variable across different units, such as households or individuals. FGLS can help address this problem, making the models estimates more accurate (Greene, 2012).

To sum up, the QQ plot suggests possible problems with normality and the variance of the error terms. However, FGLS addresses these problems effectively, making it a useful tool for obtaining more accurate estimates when heteroskedasticity and autocorrelation are present. This enhances the model's ability to accurately reflect the relationships between the explanatory variables and household expenditure.

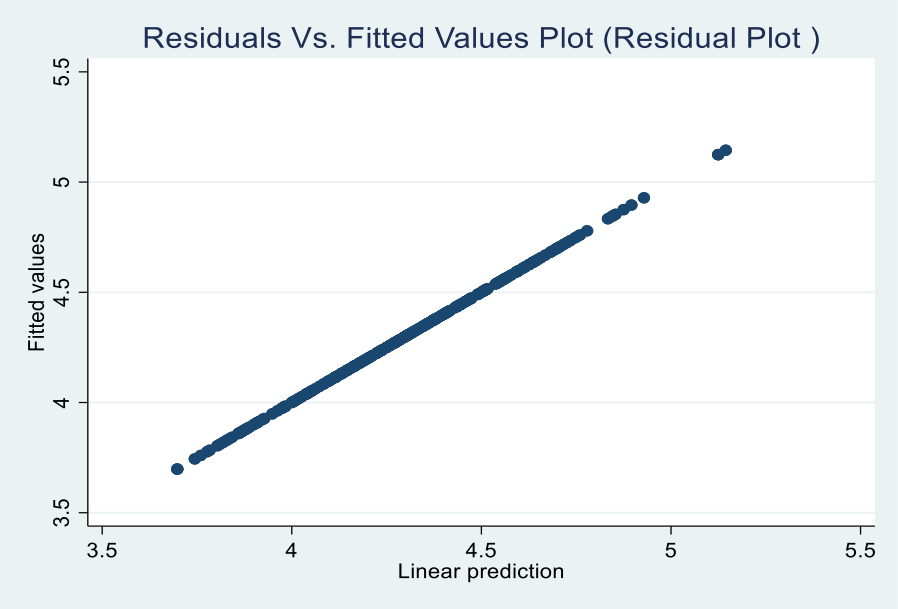
**Figure 4.4: A plot of QQ**




Source: Own computation using the data

The plot that appears to be a graph of fitted values versus linear predictions indicates to evaluate how well a model fits the data. The points align closely with a 45-degree line, indicating that model predictions match the fitted values quite well. This suggests the study model might be providing a satisfactory fit for the data, as there is little deviation between the predicted and fitted values, such result supported by the other researchers (Gujarati & Porter, 2009). Regression analysis commonly uses such diagnostic plots to assess the accuracy of model predictions and identify potential problems like systematic bias or outliers (Montgomery, Peck, & Vining, 2012).

**Figure 4.5: Histogram Distribution of Residuals in a Regression Model**




Source: Own computation using the data

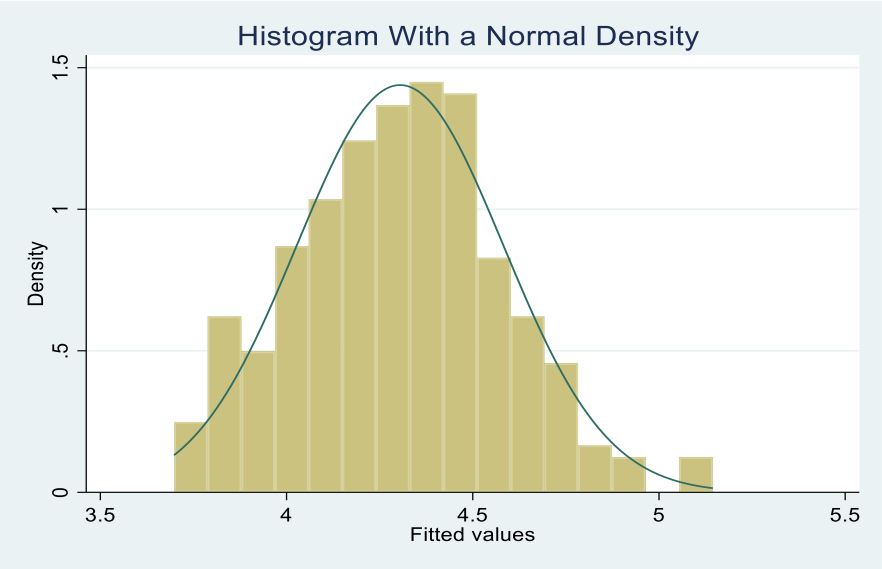
A histogram of residuals is an important diagnostic tool for evaluating a regression model. The residuals which are deviations of observed values from predicted values based on the regression model, are expected the residuals to follow a normal distribution, center around zero, and exhibit homoscedasticity across all levels of the independent variables in an ideal model.

Looking at the histogram, the residuals appear to exhibit a mostly normal pattern, suggesting that the model's predictions are reasonably accurate. As a result, the errors seem to be resistant to systematic bias, and the model is successful in capturing the overall trend present in the dataset. There are, however, signs of the presence of a few outliers and slight skewness, which implies that slight deviations from the assumed ideal conditions of normality and homoscedasticity may be present. These deviations may be areas where the model can be improved by accounting for the possible influence of outliers or by adjusting the slight skewness in the residuals.Outliers may represent extreme instances that could disproportionately affect the model's accuracy, while skewness typically indicates an incomplete representation of the underlying distribution from which the dependent variable draws its information.

To investigate further, other diagnostics, such as QQ plots or residual plots, might provide more insight. A QQ plot would offer a more precise view of how well the residuals follow a normal distribution. Residual plots could also help identify patterns that indicate misspecification or the presence of heteroskedasticity (nonconstant variance).

Ott and Larson (1990) provide a detailed exploration of residual analyses and diagnostics, elucidating issues in regression modeling with clear interpretations.

**Figure 4.6: Histogram of Residuals with Normal Density**




Source: Own computation using the data

# CHAPTER 5

# CONCLUSION AND RECOMMENDATIONS

## 5.1 Conclusion

This study examines a standard cross-sectional dataset on a representative sample of 267 urban fringe households in the Hachalu Hundesa Zone, focusing on the determinants of household vulnerability to poverty. The findings indicate that demographic, educational, and economic factors significantly contribute to the household's extreme poverty and increased vulnerability. Notably, head count poverty 34.8% of households live on less than 26.4 birrs per day, reflecting severe economic deprivation.

The result of the stage FGLS estimate signifies that the number of vulnerable households is larger than the currently poor households; the vulnerability index is 0.998 compared to the 0.356 headcount poverty index, which shows that while 35.6 % of the sampled households are poor, 99.8% of sampled households are vulnerable to becoming poor in the future, With a vulnerability index greater or equal to 0.5 or have of 50 percent and above to fall into poverty shortly, indicating almost all households are vulnerable in the future due to households of similar income status and low-income households.

The result of linear regression analysis on household expenditure identifies key socio-economic factors influencing spending patterns. Poor households typically have less money to spend per person, meaning their per capita expenditure is lower compared to non-poor households, while higher dependency ratios, low employment status, gender bias, and access to electricity are positively related to higher spending. Older age and higher educational status are associated with lower expenditure, possibly due to fixed incomes or different consumption priorities. Idiosyncratic shocks negatively affect spending, highlighting the need for safety nets. The model explains 4.47% of the variance, suggesting other unobserved factors also plays a role. Which means there are many factors the reason behind vulnerability to poverty those households

The demographic analysis reveals a notable gender disparity: 34.8% of households are headed by females. This suggests that female household heads face significant barriers in accessing opportunities. Low educational attainment further exacerbates this gender imbalance, as many household heads lack even basic literacy skills. This situation hinders access to Formal employment and limits their income. In addition, Working-age households face additional challenges due to the average household size of 5.45 and a dependency ratio of 0.84. The working-age population is 66.6% engaged in informal employment, which provides low wages and job insecurity. All the variables included in the model are statistically significant, with p-values below the standard thresholds for significance (1%, 5%, or 10%) determining vulnerability to poverty.

There for, Governmental support is needed to improve education, employment opportunities, and infrastructure development in order to alleviate poverty and strengthen household resilience in the area.

## 5.2 Recommendations

- To enhance educational access, tailor adult literacy programs and vocational training, and collaborate with local businesses can ensure that participants acquire skills that enhance their employability.
- Increasing job opportunity programs and vocational training are essential for youth and women to facilitate the workforce and support female household heads.
- Government intervention is needed for the infrastructural development of electricity, water, and proper sanitation for every household based on the standard because the area is the center of resettlement.
- Reducing household size through awareness and access to family planning may help to minimize consumption and increase savings.
- The Government should design and implement policies that raise the disposable income of households so that households to do earn more money and improve their living standard.

- Future studies are crucial for understanding vulnerability to poverty in other urban fringe areas in more detail. Whereas Future research should focus on the long-term impacts of integrated approaches to poverty reduction. The researcher can uncover grassroots solutions that may complement or enhance top-down intervention, which is missing in this study due to a lack of panel data.

# BIBLIOGRAPHY

**Alkire, S., & Foster, J. (2011),** Counting and Multidimensional Poverty Measurement: Journal of Public Economics.

**Azam, M., & Imai, K. S.** (2009) Estimating vulnerability to poverty in Bangladesh. Journal of Development Studies, 45(10), 1775-1793. https://doi.org/10.1080/00220380903124297

**Alwang, J., & Siegel, P. B.** (2000) Vulnerability: A view from the front line, World Bank.

**Bain, R. E., et al.** (2014). Sanitation access and its impact on health and poverty: Environmental Health Perspectives, 122(8), 802-810.

**Becker, G.** (1965). A theory of the allocation of time: The Economic Journal, 75(299), 493-517.

**Chambers, R.** (1989). Poverty and livelihood: *Whose reality counts?* , Institute of Development Studies.

**Chaudhuri, S.** (2002).Assessing vulnerability to poverty: A methodological overview World Bank Policy Research Working Paper, 2995. https://doi.org/10.1596/1813-9450-2995

**Chaudhuri, S., Jalan, J., & Suryahadi, A.** (2002). Assessing household vulnerability to poverty from cross-sectional data: A methodology and estimates from Indonesia: World Bank Policy Research Working Paper No. 2810: World Bank.

**Chaudhuri, S., Jalan, J., & Suryahadi, A.** (2002). Assessing household vulnerability to poverty from cross-sectional data: A methodological case study of Indonesia: World Bank Policy Research Working Paper, 2824. https://doi.org/10.1596/1813-9450-2824

**Christiaensen, L., & Subbarao, K.** (2005). Toward an understanding of vulnerability and poverty in the context of the "new poverty": World Bank Policy Research Working Paper, 3636. https://doi.org/10.1596/1813-9450-3636

**Corbetta, P.** (2003). Social research: Theory, methods, and techniques: SAGE Publications.

**Deaton, A., & Zaidi, S.** (2002). Guidelines for household welfare analysis: Measuring well-being in households of different sizes and compositions: World Bank Working Paper Series.

**Devereux, S. (1993).** Theories of poverty and the poverty of theories: A review of poverty reduction strategies in sub-Saharan Africa. Journal of Development Studies, 29(2), 103-118. https://doi.org/10.1080/00220389308422397

**Devereux, S. (2002).** The impact of droughts and floods on food security and poverty reduction strategies in rural Ethiopia: IDS Working Paper 157, Institute of Development Studies.

**Dercon, S. (1999).** rural poverty and vulnerability in Ethiopia: Institute of Development Studies.

**Dercon, S., & Krishnan, P.** (2003), the impact of idiosyncratic shocks on poverty: Journal of Development Economics, 71(1), 1-21.

**Dutta, P.** (2010), a critical review of models to estimate vulnerability to poverty. Journal of Economic Development, 35(1), 89-106.

**Filmer, D., & Pritchett, L. H.** (2001), estimating wealth effects without expenditure data or tears: An application to educational enrollments in states of India. Demography, 38(1), 115-132.

**Foster, J., Greer, J., & Thorbecke, E.** (1984). A class of decomposable poverty measures: Econometrics, 52(3), 761-765. https://doi.org/10.2307/1913475

**Greene, W. H.** (2012). Econometric Analysis (7th ed.): Pearson Education.

**Gujarati, D. N.** (2009), Basic econometrics (5th ed.): McGraw-Hill Education.

**Hossain, N.** (2005). The role of coping strategies in poverty reduction: Evidence from Bangladesh. World Development, 33(6), 1065-1079.

**Heitzmann, K., Haughton, J., & Picazo, O.** (2002), Vulnerability and poverty: A framework for analyzing and addressing risks: World Bank Development Report, 102.

**Holzmann, R., & Jørgensen, S.** (2001), Social risk management: A new conceptual framework for social protection and beyond. International Social Security Review, 54(2), 27-47. https://doi.org/10.1111/1468-246X.00052

**Jain, A. K., Murty, M. N., & Flynn, P. J. (1999),** Data Clustering: A Review, ACM Computing Surveys.

**Kabeer, N.** (2002). The power to choose: Bangladeshi women and labor market decisions in London and Dhaka. Development and Change, 33(2), 107-135.

**Kabeer, N.** (2005), the importance of social protection for the development of a sustainable poverty reduction strategy: Development in Practice, 15(4), 381-393. https://doi.org/10.1080/09614520500084861

**Khamis, M., & Reem, R.** (2019), Unemployment and financial strain in households: Labor Economics, 15(2), 267-282.

**Kiran, S., & Dhawan, N.** (2015), Impact of household size on consumption behavior in rural India: Journal of Development Economics, 114, 45-56.

Kothari, C. R. (2004). Research Methodology: Methods and Techniques.

**Ligon, E., & Schechter, L.** (2003), Measuring vulnerability: Economic Journal, 113(486), 95-115. https://doi.org/10.1111/1468-0297.00009

**Ligon, E., & Schechter, L.** (2003), Measuring vulnerability: Economic Journal, 113(485), C95–C114. https://doi.org/10.1111/1468-0297.00009

**Melkamu, A.** (2020).Research methodology and design: Addis Ababa University Press.

**Moser, C.** (1998). The asset vulnerability framework: Reassessing urban poverty reduction strategies. World Development, 26(1), 1-18. https://doi.org/10.1016/0305-750X(97)10007-4

**Pritchett, L., Suryahadi, A., & Sumarto, S.** (2000), quantifying vulnerability to poverty: A proposed measure with application to Indonesia: Journal of Development Economics, 59(2), 1-37.

**Quisumbing, A. R.** (2002). Food security, vulnerability, and poverty: A conceptual overview. World Development, 30(7), 1197-1217. https://doi.org/10.1016/S0305-750X(02)00057-6

**Rakodi, C.** (2002). Urban livelihoods: A people-centered approach to reducing poverty: Earthscan.

**Ravallion, M., Chen, S., & Sangraula, P.** (2009). A dollar a day revisited. World Bank Economic Review, 23(2), 163-184. https://doi.org/10.1093/wber/lhn017

**Saaty, T. L. (1980).**The Analytic Hierarchy Process: McGraw-Hill.

**Sahn, D. E., & Stifel, D.** (2003).Exploring alternative measures of welfare in the absence of expenditure data: Review of Income and Wealth, 49(4), 463-489.

**Sekhampu, T. J., & Niyimbanira, F.** (2013), marital status and economic well-being of households: Journal of Social Economics, 30(2), 120-130.

**Tafere, Y.** (2021), Rural-urban migration and poverty in Ethiopia: International Journal of Urban and Regional Research, 45(3), 560-577.

**Tseday, G., & Finn, L.** (2021), Persistent and migratory poverty in Ethiopia: An analysis of socio-economic mobility. Ethiopian Journal of Economics, 29(1), 45-67.

**UN-Habitat (2018).**The state of African cities 2018: The geography of African investment: United Nations Human Settlements Programme.

**UNDP (2010),** Human Development Report: Multidimensional Poverty Index.

**UNDP (2022),** Ethiopia human development report 2022: Achieving inclusive growth through human development: United Nations Development Programme.

**UNICEF (2021),** Water, sanitation, and hygiene in urban areas: Challenges and solutions: UNICEF Report.

**Watts, M. J. & Bohle, H. G. (1993).T**he space of vulnerability: The causal structure of hunger and famine. Progress in Human Geography, 17(1), 43-67. https://doi.org/10.1177/030913259301700103

**World Bank (2000),** World Development Report 2000/2001: Attacking poverty: World Bank.

**World Bank (2016).**Poverty in Ethiopia: Assessment of poverty trends 2015-2016: World Bank.

**World Bank (2023).**Global poverty updates 2023: World Bank.

**World Bank (2021).**Urban development and infrastructure in Ethiopia: World Bank.

**World Bank (2021).**Poverty headcount ratio at national poverty lines (% of population) Urban Ethiopia. https://data.worldbank.org/indicator/SI.POV.DDAY?locations=ET

# APPENDICES

**Appendixes 1: Ordinary Least Squares (OLS) regression analysis**

| Log Expenditure | Coefficient | Std. err. | t statistic | P>\|t\| |
|---|---|---|---|---|
| Household size | -.0845704 | .0085646 | -9.87 | 0.000*** |
| Gender | .1136182 | .0416978 | 2.72 | 0.007*** |
| Age | -.00302 | .0015276 | -1.98 | 0.049** |
| Dependency Ratio | .0896888 | .0348009 | 2.58 | 0.011*** |
| Marital status | .0677774 | .0292454 | 2.32 | 0.021** |
| Educational status | -.1087594 | .0427366 | -2.54 | 0.012** |
| Employment status | .1252036 | .0480674 | 2.60 | 0.010*** |
| Electricity Access | .1167297 | .0489569 | 2.38 | 0.018** |
| Saving | .2544563 | .083543 | 3.05 | 0.003*** |
| Health status | .1201704 | .0406391 | 2.96 | 0.003*** |
| Idiosyncratic Shock | -.0738206 | .0180784 | -4.08 | 0.000*** |
| Cons | 4.994762 | .1495019 | 33.41 | 0.000*** |
| Numberof obs=267 | R-squared=0.4470 | | | |
| F(11, 255) =18.74 | Adj R-squared=0.4232 | | | |
| prob >F=0.0000 | Root MSE =0.315 | | | |

**Appendixes 2: Exposure to idiosyncratic shocks index**

A. Dummy variable equal to one if the household member faced illness or disorder in the last 12 months, 0 otherwise.

B. Dummy variable equal to one if there is job loss among the household members in the previous 12 months, 0 otherwise.

C. Dummy variable equal to one if the household experienced the death of a household members in the last 12 months, 0 otherwise

D. Dummy variable if the household member faced a significant increase in prices of essential goods (food, fuel) in the last 12 months, 0 otherwise.

## Calculation of Exposure to Idiosyncratic Shocks

The Exposure to Idiosyncratic Shocks Index assesses the extent to which households experience diverse shocks. This index serves as a crucial tool for evaluating the exposure of households to various shocks. We derive this index to quantify the composite impact of various shock types, combining the impact type and occurrence of each type of shock using the provided equation.-

| **Shock Type** | **Severity($S_i$)** | **Frequency($f_i$ )** | **Contribution**$(S_i * f_i)$ |
|---|---|---|---|
| A household member's illness necessitates substantial medical costs. | 5 | 0.3 | 1.5 |
| Job loss of a primary income earner | 5 | 0.2 | 1.0 |
| Death of a family member | 5 | 0.1 | 0.5 |
| Significant increase in prices of essential goods (food, fuel) | 5 | 0.5 | 2.5 |
| Total Exposure Index | | | 5.5 |

Where:

- **Severity** ($S_i$) **is** indicating the level or impact of the$i^{th}$ shock; the greater the value, the more severe the shock

- **Frequency** between 0 and 1, with 0 meaning the shock does not occur and 1 indicating ($f_i$ ) is the likelihood of the shock occurring, expressed as a value

Vulnerability analysis and risk management commonly use this approach (Dercon, 2004; Hoddinott & Quisumbing, 2003), which allows for a comprehensive, continuous measure of household exposure to shocks. By combining the severity and frequency, the **Exposure Index** provides a more nuanced understanding of vulnerability.

## Calculation of Exposure to Idiosyncratic Shocks for Households

The following table illustrates the calculation of the Exposure to Idiosyncratic Shocks Index for the study's households, accounting for four significant shocks typically reported by urban households:

The **Exposure Index** of **5.5** reflects the household's overall exposure to idiosyncratic shocks, considering the severity and frequency of each shock. A higher index indicates greater vulnerability to the negative impacts of shocks. In this research, the selected shocks, such as illness, loss of a job, death of a family member, and price increase, are most relevant for the urban households in the study area as they have heavy consequences on households' income, expenditures, and well-being.

**Appendixes 3: Multicollinearity test**

| Variable | VIF | 1/VIF |
|---|---|---|
| Household size | 1.40 | 0.711978 |
| Employment status | 1.38 | 0.723805 |
| Educational status | 1.36 | 0.737667 |
| Dependency Ratio | 1.28 | 0.778378 |
| Idiosyncratic Shock | 1.16 | 0.863739 |
| Age | 1.13 | 0.887917 |
| Marital status | 1.13 | 0.888666 |
| Saving | 1.12 | 0.893147 |
| Electricity Access | 1.11 | 0.900719 |
| Health status | 1.10 | 0.912380 |
| Gender | 1.06 | 0.941618 |
| Mean VIF | 1.20 | |

The results show that all VIF values are well below the critical threshold of 10, with a mean VIF of 1.20. This confirms that multicollinearity is not a concern in this model, and each predictor contributes uniquely to explaining household expenditure.

**Appendixes 4: Method for Annualizing Consumption Expenditure Data**

To compute all consumption data to annual (365-day) basis, Non-food items the data collected in annually in 365 days thus used directly without adjustment but Food items the data collected in monthly whereas Expenditures reported for the past 30 days were annualized by multiplying by $\frac{365}{30} = 12.17$

$$\textbf{Annualized food } = \textbf{30 day value} = \frac{\textbf{365}}{\textbf{30}}$$

This method follows standard methods recommended by Deaton and Zaidi (2002) and the World Bank LSMS guidelines (World Bank, 2022), enabling consistent aggregation of consumption expenditure across items with different periods.

**Appendixes 5: Method for Calculating Adult Equivalent Household Size**

In this study household consumption adjusted using an adult equivalence scale to account for differences in the consumption needs across age groups

The formula applied

$$\boldsymbol{AE} = (\boldsymbol{Number\ of\ children} * \mathbf{0.5}) + (\boldsymbol{Number\ of\ Young} * \mathbf{1.5}) + (\boldsymbol{Number\ of\ \ Adults\ } * \mathbf{1})$$

This approach aligns with standard practices in the consumption and welfare analysis as recommended by Deaton and Zaidi (2022) and World Bank LSMS guidelines (World Bank, 2022)

**Appendixes 6: Residential area in Hachalu Hundesa Zone**

Source, Photo taken by the author, 2024

# *ANALYSIS OF URBAN FRINGE HOUSEHOLD VULNERABILITY TO POVERTY IN A LOW-INCOME AREA IN ADDIS ABABA CITY: A CASE STUDY OF HACHALU HUNDESA ZONE OF KOYE FECHE SUB-CITY*

**Dear respondent**

Hello. My name is Hanan Nesru. I am a postgraduate student at Addis Ababa University. I am conducting a survey about "Urban fringe Household Vulnerability to Poverty in a Low-Income Area in Addis Ababa City: A Case Study of Hachalu Hundesa Zone of Koye Feche sub-city" The information collected will help develop an academic study concerning vulnerability to poverty. All of the answers you give will be kept confidential and will not be shared with anyone. In case you need more information about the survey, you may contact the researcher via the following addresses: e-mail-hnesru0@gmail.com and phone number. +251978063279.

Region: _____

Sub City: _____

Woreda: _____

Interviewer: _____

Date of interview: _____

Comments by supervisor: _____

Household ID code: _____

## PART I: BASIC DEMOGRAPHICS AND ECONOMIC ACTIVITY OF HOUSEHOLD MEMBERS

1. What is the Gender of household head?
   Male=1 Female=2
2. Age of household head _____
3. What is your marital status?
   Single=1 Married=2 Widowed=3 Divorced=4

4. How many persons are in the household, who are normally living together for six months or more stay for six months or more and taking food from a common

   _____

5. Are you head of Household?
   Yes=1 No=2
6. If yes, go to Q 7, If not what is the relationship to the head of the house hold?
   Mother =1 Father =2 Brother =3 Sister =4 other relative=5
7. Dose has any disability?
   Yes=1 No =2
8. If yes, what type of disability happen? _____
9. Have you ever attended the school?
   Yes=1 No =2
10. If yes, what is the higher Education level of household head that has Complotted?
    No formal education=1 primary=2 secondary and University =3
11. How long has your household resided in Hachalu Hundesa Zone?
    Less than 1 year=1 , 1-5 years=2 , 6-10 years=3 More than 10 years=4

12. During the last 12 months, did earn/ has got any income/remittance?
    Yes=1 No=2

13. Main Whether any household member (excluding those employed by the household and paying guests) was engaged in economic activities during last 365 days?
    Yes=1 No=2

14. What is source of income for your household?

    Informal business =1

    Formal employment =2

15. Do you have access to the following basic amenities?

- ✓ Clean and reliable drinking water

  Yes=1 No =2

- ✓ Proper sanitation facilities (toilet)

  Yes=1 No =2

- ✓ Electricity

16. What is your current health status?

    Good=1  poor=2
17. Does your household own or rent your current dwelling?

    Own=1, Rent=2, Squatter settlement =3

18. Do you have any type of land ownership (formal or informal) within urban fring Addis Ababa?
    Yes=1 No =2

## PART II: ACCESS TO CREDIT AND SAVING SERVICES

19. Has your household been able to save any income over the past 30 days?
    Yes =1 No=2
20. If yes, how much has your household been able to save? Br_____
21. What is the source of borrowing?
    Bank =1
    Credit Unions =2
    Micro finance =4
    Other =5
22. Does anybody from your household own many to you with interest
    Yes =1 no=2
23. How much ?Br. _____
24. What Monthly interest rate from the bank or Microfinance you regard as satisfactory?
    _____%
25. what interest rate from bank would you regard as sufficient to make it unnecessary to carry out private business( if the rate was guaranteed) _____%

26. Are you a member of Iqqub at present?
    Yes=1 No =2
27. If you are a member of Iqqub, how much do you contribute per month? Br._____

28. Are you a member of Iddir at present?

    Yes=1 No =2
29. If you are a member of Iddir, how much do you contribute per month?

    Br._____

## PART III: HOUSEHOLD VULNERABILITY FACTORS AND COPING STRATEGIES

30. In the past year, has your household experienced any of the following challenges (idiosyncratic shocks)? 1=yes ,2= no

| Types of shock | 1=yes ,= no |
|---|---|
| Illness of a household member requiring significant medical expenses | |
| Job loss of a primary income earner | |
| Death of a family member | |
| Significant increase in prices of essential goods (food, fuel) | |
| Others ( specify | |

31. If yes, how did your household cope with these major shocks /hardships? _____

| Types of strategies | Yes=1 No =2 |
|---|---|
| Reduce spending on food | |
| Borrow money from friends or family | |
| Sell household assets | |
| Rely on support from charities or NGOs | |
| Look for additional income-generating activities | |
| Others ( specify) | |

## IV: GOVERNMENT PROGRAMS

32. Are you aware of any government programs aimed at reducing poverty in Addis Ababa?
    Yes=1 No =2
33. If yes, have you participated in any of the following programs?

    Food subsidy programs=1

    Microfinance loan programs=2

    Skills training programs=3

    None of the above=4

34. What does the financial support from the Government for household?(like food, cash and loan)
    Yes =1 No=2
35. If you participated in any programs, how effective were they in helping your household?

    Not effective at all=1

    Somewhat effective=2

    Very effective=3

## VII: CONSUMPTION EXPENDITURE

We would like to ask you about all the food that was bought for consumption and/or was consumed from your own stock, in last 30 days. Please do not include food bought for resale, even after processing (aggregate from the different sources should be equal to the total amount consumed).

Is the household has purchased any prepared food, or eaten elsewhere against payment in the last months? Yes=1, No=2, if yes total expenditure in the last 7 days (in birr)_____

| | | | | | |
|---|---|---|---|---|---|
| | **FOOD EXPENDITURE** | | | | |
| | | | Unit (Amount ) | Birr | |
| 1 | Cereals whole Grain | Teff, Barley, Wheat ,Maize Sorghum, Finger ,Millet/oats, Finger ,Millet Rice | | | |
| 2 | Cereals Flours including Furno duket, Besoduket | Teff, Barley, Wheat ,Maize Sorghum, Finger ,Millet/oats, Finger ,Millet Rice Flours | | | |
| 3 | Pulses whole Grain | Lentils(mesir)and others like | | | |
| 4 | Pulses Flours | shiroduket | | | |
| 5 | Oil seeds | | | | |
| 6 | Pasta products | Macaroni and Pasta | | | |
| 7 | Breads and other prepared food Enjera | Breads and Enjera | | | |
| 8 | Meat, fish | Meat, fish | | | |
| 9 | Milk ,cheese ,egg | Milk ,cheese ,egg | | | |
| 10 | Oils and fat | Linseed(teliba) ,Boleke ,Sesame/,selit Nug ,Groundnut,/lewuz gulo…. | | | |
| 11 | Vegetables | Carrot ,Tomatoes Gomen (selata, kosta | | | |
| 12 | Fruits | Sugar cane, banana, Zeytihun, Avocado ,Papaya | | | |
| 13 | Spices | Berbere Garlic,nech Jingibil ,abish | | | |
| 14 | Potatoes ,Tubers ,onions | Potatoes ,Tubers ,onions | | | |
| 15 | Coffee ,tea | Coffee ,tea | | | |
| 16 | Other food items (salt, sugar ,honey) | Other food items (salt, sugar ,honey) | | | |
| 17 | Nonalcoholic beverage | Soft drink | | | |
| 18 | alcoholic beverage | Tella Arequi Teji Beer (Bira) | | | |
| 19 | Cigarettes , chat | Cigarettes , chat | | | |
| | **NON-FOOD EXPENDITURE** | | | | |
| | Clothes and shoes ,Cooking materials &lighting, Cleaning and personal care items, Educational expenses, Medical expenses, Social and othercontributions, Transportationexpenses, Service charge, Ceremonial expenses Cigarettes & chat | | | | |
| 20 | Cooking material | Fuel ,charcoal , Matches and Batteries | | | |
| 21 | Water bill (other related) | Water bill (other related) | | | |
| 22 | Electricity | Electricity | | | |
| 23 | Household operation and | Furniture and lamp/ | | | |

| | | | | | |
|---|---|---|---|---|---|
| | durable | torch Building material for houses and other | | | |
| 24 | Medical expanse | Modern and traditional medical expanse | | | |
| 25 | Transportation expanse | Transportation expenses including both for man and goods, livestock etc. | | | |
| 26 | Social and other contribution | Contribution to Church/ Mosque and Other voluntary contribution (not forcredit) | | | |
| 27 | Personal care | Soap (both for close andbody), omo (soap powder), others …Cosmetics; Hair Oil(both men &women), Hair butter purchase ,Hair butter from own product | | | |
| 28 | Clothing | Clothes/shoes/fabric foradults (both men and women) Clothes/shoes/fabric for children (both boys and girls) do not include a student‟s uniform Linens; sheets, towel, blankets, others | | | |
| 29 | footwear | footwear | | | |
| 30 | Rent | Rent | | | |
| 31 | Maintenance of household equipment | Maintenance of household equipment | | | |
| 32 | Educational expanse | Educational materials: books, pen, pencil, bags, uniform etch | | | |
| 33 | Personal goods ( jewelry ) | Personal goods ( jewelry and others | | | |
| 34 | | | | | |

NB; What is the quantity and value of the items procured by the household for Clothes and shoes ,Cooking materials &lighting, Cleaning and personal care items, Educational expenses, Medical expenses, Social and other contributions, Transportation expenses, Service charge, Ceremonial expenses Cigarettes & chat *of during* last 365 days?