DETERMINANTS OF URBAN FOOD INSECURITY IN BURAYU TOWN OF SHEGER CITY ADMNISTRATION IN OROMIA REGION OF ETHIOPIA

BIKILA MERGA TOLERA

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COLLAGE OF BUSINESS AND ECONOMICS

DETERMINANTS OF URBAN FOOD INSECURITY IN BURAYU TOWN OF SHEGER CITY ADMNISTRATION IN OROMIA REGION OF ETHIOPIA

A thesis submitted to the department of economics in partial fulfillment of the requirements for Master of Science degree in Development Economics

Advisor: Birhanu Denu (PhD)

Submitted by: BIKILA MERGA

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DECLARATION

I declare that, this Master's thesis entitled "Determinants of Urban Food Insecurity in Burayu Town of Sheger City Administration in Oromia Region of Ethiopia" is my original work and all data that used in this research paper have been properly acknowledged. I also declare that this paper has not been submitted either in part or in full to any other higher learning institution for earning degree.

Name: **BIKILA MERGA**

Signature: _____

Date: _____

APPROVAL SHEET

This is to Certify that the thesis prepared by BIKILA MERGA, entitled: "Determinants of urban food insecurity in Burayu Town of Sheger City Admnistration in Oromia Region of Ethiopia" submitted in partial fulfillment of the requirements for the degree of Master of Science in Development Economics as the regulations of the University and fitting the accepted standards.

Examining Committee:

Birhanu Denu (PhD): _____ _____

Advisor's name Signature Date

_____ _____

Internal Examiner's name Signature Date

_____ _____

External Examiner's name Signature Date

_____

Chair of Department or Graduate Program Coordinator

ACRONYMS AND ABBREVIATIONS

ESS	Ethiopian Statistical Service
FAO	Food and Agriculture Organization
FCS	Food Consumption Score
FGDs	Focus Group Discussions
GHI	Global Hunger Index
GIEWS	Global Information and Early Warning System
HDDS	Household Dietary Diversity Score
HFIAS	Household Food Insecurity Access Scale
HFIAP	Household Food Insecurity Access Prevalence
IDP	Internally Displaced People
IFAD	International Fund for Agricultural Development
NGO	Non-Governmental Organization
PPS	Probability Proportion Size
SDG	Sustainable Development Goal
UN	United Nations
UNDP	United Nations Development Plan
UNICEF	United Nations Children's Fund
WB	World Bank
WFP	World Food Programme
WHO	World Health Organization

DEDICATION

This thesis work is dedicated to all my beloved family, for their patience, love and dedicated partnership in the success of my life.

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ABSTRACT

Food insecurity is a global problem that affects individual, family and nations as a whole. Urban food insecurity is one of the problems that need attention, due to the limitation of most of the studies to the analysis of the risk of food insecurity only as a problem of rural areas. The study analyses the determinants of urban household food insecurity, in Burayu town of Sheger City Administration of Oromia Region in Ethiopia. For this study, a cross-sectional data type design and two-stage sampling procedure were used to collect 386 sample households randomly in Burayu town; Descriptive statistics and Binary Logistic models were used to describe and analyze the determinants of food insecurity in the study area. The HFIAS results of the study suggested that, most of the households are food insecure, which is about 79% the households in the area were in the risk of food insecurity and 21% of the households were food secure. Based on the HFIAP result, the extent of food insecurity was categorized into; about 26% of the households mildly, 41% moderately, and 12% were severely food insecure. The output of the binary logistic model show that, age, house ownership, income, asset and remittance, educational level of the household heads were negatively and significantly correlated with food insecurity status of household and only dependency ratio and food expenditure were positively associated with food insecurity. Finally, food insecure households were practiced dietary change coping strategies as well as short-term i.e. relying on asset and support coping mechanisms to cop-up the food shortage. In general, to minimize the risk of food insecurity in the study town, the government and development actors should encourage the food insecure households through short-term training on business ideas, give food or financial support for severely food insecure and expand different job opportunities in the town for urban poor.

Key words: *Household, Food insecurity, Binary Logistic, Urban, Burayu, Ethiopia*

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Food insecurity is a global problem affecting individuals and families of all economic backgrounds. It is a situation when people lack access to enough food for an active, healthy lifestyle due to inadequate resources or limited access to safe and nutritious foods. In addition, known as "food poverty" (Cuncic, 2023). In the world, food insecurity is a major issue, about 29.3% (percent) of the world total population i.e. 2.3 billion People were moderately or severely food insecure in 2021 (UN, 2022).

The agenda for sustainable Development by 2030 puts forward a transformational vision, recognizing that our world is changing, bringing with it new challenges that must be overcome if we are to live in the world without hunger, food insecurity, and malnutrition in any of its forms. But, still globally above 820 million people are hungry which underscore the massive challenge of achieving the target of Zero Hunger by 2030 (FAO *et al.*, 2019).

In 2020 in Africa one in five people faced hunger, above one-third of the continent was undernourished, and 282 million people were experiencing hunger. The number of hungry people continues to rise due to conflict, drought, and the COVID-19 pandemic and is more than double the proportion of any other region in the world. Conditions are deteriorating across East Africa, where 7.2 million people are at a risk of starvation and 26.5million face acute food insecurity. At least 12.8 million children in the region are acutely malnourished (Huber and Omer, 2022).

According to Global Hunger Index in 2023, out of 125 countries, Ethiopia ranks 101st with the score of 26.2, which shows that, the Ethiopian hunger level is on a serious stage (GHI, 2023). Truly, the Ethiopian government has made an important development expansion over the last two decades through expanding basic social services by investment and reducing poverty. However, still hunger, malnutrition and food are the major issue across the country. In the country, around 20.1 million people needs food support still today, that includes internally displaced people (IDPs), who leave their homes due to civil war in the north, the western areas and the severe drought in the south and southeast (WFP, 2022).

Humanitarian Response Plan (2023) reported, around 20.1% (percent) of the total population of the country need emergency food assistance. The challenge of food security situation is basically due to the continuous existence of the civil war in north, western and the droughts in southern areas are affecting food access and availability in Ethiopia. The other factors that complicate hunger in Ethiopia are the severity of macroeconomic difficulties and unexpected inter communal violence across the country. Additionally, seasonally increased price of locally produced cereal productions like teff, maize and wheat as well as sustainable depreciation of the national currency inflates imported inputs and fuel prices (FAO, 2023).

Majority of the studies viewed food insecurity as a problem of rural population only with less concern is given to the urban poor whose livelihoods are much vulnerable (Crush and Riley, 2019). Increase in food prices complicate food access instability (FAO *et al.*,2019) and most of the inhabitants in the towns are dependent on the market (exchange economies) to get food (Crush and Riley, 2019). Food insecurity in urban area is strongly driven by income limitations (i.e. poor households are allocate a high percentage of their total income to purchase food and they are highly vulnerable to external shocks including loss of job, problem of health and price of food inflation). In urban areas, the programs of food assistance and social protections were designed to facilitate accessibility of food such as food banks, monetary (in-kind transfer schemes) and community kitchens, are often not sufficient to fully resolve food insecurity problems by themselves due to they do not address the barriers like lack food storage and cooking facilities, and lack competing housing and health expenses (FAO *et al.*, 2023).

In Ethiopia, food insecurity is a challenge to the country's already underdeveloped economy basically, migration from rural to urban impacts on raising indolent people in the towns (Dersolegn *et.al*, 2023). For the urban population living in poverty, the majority of easily available and affordable diets tend to be not safe. Concerned with the accessibility of nutritious foods, these kinds of foods are more expensive, or in some cases not available in more urbanized areas. Otherwise, in less developed countries low-level income households wanted to prioritize their dietary energy requirements over the quality nutrition by spending their income on more affordable foods, which tend to be of high energy density but have less nutritional value (FAO *et al.*, 2023).

In urban Ethiopia, sustained high food prices, high rates of urban poverty, and a growing urban population is experienced. The result of the studies in urban Ethiopia revealed that, reduction in meal size and shifting to poor quality food types are among the common coping strategies to high food price used by households (Birhane *et al.,* 2014 and Samuel *et al.,* 2021). The urban poor residents are impoverished i.e. most of them are socially disadvantaged and face the problem of inadequate service in terms of infrastructure and institutional assistance (Dersolegn *et.al*, 2023).

According to Dinku *et al.(*2023) and Teshager (2020) in the town feeding, providing shelter, paying school fees and health services are more expensive. Most of the poor households limit the quality and quantity of their food and rely on less preferred and inexpensive food when they faced the problem of food insecurity and particularly, the households with severe food insecurity problem were go out for beg from someone or even could go the whole day and night without eating anything in Ethiopia.

As a whole, food insecurity is a situation that concerned with the lack of accessibility and availability of food to enough food for healthy and active lifestyle due to lack of income or unavailability of safe and nutritious foods. It is the problem affecting global, national, families and individuals of all economic backgrounds. Last years, food insecurity is considered as a problem of rural households only, but recently the studies suggest it is a critical challenge for urban poor households.

1.2 Statement of the Problem

Food insecurity had complicated the country's already precarious economy; mainly the migration of rural to urban is raising indolent people in different Ethiopian towns (Dersolegn *et.al*, 2023). Birhane *et al.,* (2014), in urban Ethiopia continuous increase of food prices, urban poverty, and a high growing urban population is experienced. In urban areas, feeding, providing shelter, paying school fees and health services are more expensive. Most of the households limit the quality of their food and rely on less preferred and inexpensive food to eat when they faced the problem of food insecurity and some of the households with severe food insecurity problem have to go out for help from out the their families or even could go the whole day and night without consuming any kinds of food in Ethiopia (Teshager, 2020).

In developing countries, there is rapid urbanization with unplanned economic growth (Mutisya *et.al*, 2016**).** According to Tefera and Birhanu (2023), in Ethiopia, Burayu town is one of the rapidly developing cities both demographically and spatially. In the city, most of the low-level income households are registered as informal settlers, and the informal houses are demolished due to urban planning. However, many of the households in the study area are living in either uncomfortable houses or rented houses recently. The urban residents are impoverished; most of them are socially disadvantaged and face the problem of inadequate service in terms of infrastructure and institutional assistance (Dersolegn *et.al*, 2023).

Most of the study used a single measurement method to measure food security such as kilo calorie food intake (Ejigayhu and Abdi, 2013), (Meskerem and Degafa, 2015), (Tsige, 2022) and (Dersolegn *et.al*, 2023). But to measure the entire food security dimension, a single measurement method could not work. According to FANTA (1992) and Solomon *et al.* (2021), HFIAS, CSI, and DDS indicators in combination can help to measure all four dimensions of food security. Therefore, this study used the three indicators HFIAS, CSI, and DDS methods to measure household's food security status.

Finally, Knowledge about the subject in the study area is scarce, not only in the study area but even in Ethiopia. Furthermore, no any study undertaken and published concerned with Burayu town regarding urban household food insecurity. However, the gap that the researcher wants to fill by undertaking this research is to show factors that determine food insecurity, the extents and the coping strategies of urban household food insecurity particularly with emphasis on Burayu town, Sheger City Administration in Oromia Regional State of Ethiopia.

1.3 Research Questions

- What are the extents of food insecurity of the urban poor in the study area?
- What are the determinants of urban food insecurity at the household level?
- What are the coping strategies practiced in the study area to minimize food shortage?

1.4 Objective of the Study

The objective of the study is to measure the level and determinants of urban food insecurity situation in Burayu town, Sheger City Administration, Oromia Regional State in Ethiopia.

1.4.1 Specific objectives

The specific objectives of this research are addressed as the following:

- To identify the extents of food insecurity of the urban poor in the study area
- To determine the factors that affects urban food insecurity at household level
- To assess coping strategies to secure urban food shortage problems

1.5 Significance of the Study

The study is believed to be important, since it will assess the current and updated factors that hinder and encourage household food security in the study area. The study may help policy makers in the reformulation of food security policies in our country. It also serves as a stepping-stone for the other researchers in the future.

1.6 Limitations and Scope of the Study

This research has focused on addressing determinants of household food insecurity of households in Burayu town of Sheger City, Oromia Regional State of Ethiopia. The study only focused on the microeconomic variables that determine urban food insecurity and it ignores the macroeconomic determinants of food insecurity. This research dealt with only the determinants of household food insecurity under urban socioeconomic conditions. The study is limited to Sheger City Administration, Burayu town residents, and it may not be enough to represent all Ethiopian urban food insecurity.

1.7 Organization of the Study

This paper contains different five chapters. In the introduction part background of the study, statement of the problem, research question, objectives of the study, significance, limitations and scope of the study were included. Next, all theoretical literature, empirical literature and conceptual framework of the study were reviewed in detail. In the third chapter, about the study area, different methods used to data collection and analysis, data sources and types, different measurements of food insecurity, determinants of food insecurity and the variables were described. Finally, in chapter four and five the result of the study was discussed precisely in a proper way and concluded as well as recommended respectively.

CHAPTER TWO: LITERATURE REVIEW

2.1 Theoretical Literature

2.1.1 Definition of food security

"Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (World Food Summit,1996).

According to FAO (2006), the widely accepted definition of food security points the four dimensions of food securities; which are food availability, food access, food utilization, and food stability.

Food availability: food availability refers the physical availability of sufficient quantities of food with appropriate quality that supplied through domestic production or imports including food aid (FAO, 2006). It addressed with supply side of food security. It is measured at national level, where data is sourced from national food balance sheets (FAO, 2013).

Food access: food access is deals with the accessibility to food by individuals to enough resources or income for satisfying applicable foods for a nutritious diet. It is the access to all the combination of commodity bundles over which a right given by the legal, political, economic and social arrangements of the community in which they live. It is the demand side of food security dimensions (FAO, 2006). HFIAS, DDS, and CSI methods are widely utilized to measure food security in underdeveloped countries (Bogale *et al.* 2021).

Food Utilization: food utilization is concerned with safety and quality to satisfy the nutritional well-being, where all physiological needs must meet (i.e. it brings out the non-food inputs importance in food security). Food utilization is usually measured by using the indicators such as DDS and food consumption surveys as well as using anthropometric measures (FAO, 2023).

Food Stability: It is concerned with the existence of food availability, food access and food utilization at all times. Otherwise, it refers the access of adequate food by the families or individuals at all times. They should not risk losing access to food due to sudden shocks or seasonal food insecurity (FAO, 2023).

2.1.2 The duration of food insecurity

According to FAO (2008), food insecurity is categorized in terms of time duration such as chronic food insecurity occurs if it is difficult to meet minimum food requirements over a sustained period, transitory food insecurity refers the occurrence of a sudden drop in the ability to produce or access to sufficient food to sustain a good nutritional status and seasonal food insecurity is falls between chronic and transitory food insecurity. As well as, Food security is ranged into; hunger, malnutrition, poverty, food security and food insecurity (FAO 2008).

2.2 Concepts of Food Insecurity

The term food insecurity first evolved and defined in terms of food supply during the conference of world food conference in 1974. It assures availability of food and price stability of basic foodstuffs at the global and national level. It is defined as availability of world food supplies of basic foodstuffs to consumption sustainably and adequately at all times and to offset fluctuations in production and prices (FAO, 2006).

According to (FAO, 1983), the concept of food insecurity analysis focused on food access based on a definition the balance between supply and demand sides of the food security equation. It is ensuring that all people at all times have both physical and economic access to the basic food that they need.

Previously food security was analyzed at national level of aggregation only. But, the definition revised includes the individual and household food security. The World Bank report of 1986 on poverty and hunger focused on temporal dynamics of food insecurity was the highly influential report. The distinction among chronic food insecurity, related with problems of continuing or structural poverty and low incomes, and transitory food insecurity, which involved periods of intensified pressure caused by natural disasters, economic collapse or conflict (World Bank, 1986). The World Food Summit (1996), definition is also expand the concept into multidimensional nature of food security that includes food access, availability, food utilization and stability. In addition, it is enabled policy responses, which focused on the promotion and recovery of livelihood options.

Recently, the dimension of food security has become into focus based on the ethical and human rights. In 1996, the formal adoption of the Right to Adequate Food marked a milestone

achievement by World Food Summit delegates. It pointed the way towards the possibility of a rights based approach to food security (FAO, 2006).

The concept of food security is originated from a national security prospective emphasized on agricultural production, and achieving national self-sufficiency goal (Georges *et al.,* 2017). According to this viewpoint, the main case for food insecurity and the bad effect to national security objectives is a tainted food supply. Consequently, under this theory the major tools for assessing food security developed from macroeconomic assessments of a nation's food supply. The idea of food security established on intricate, multi scale spatiotemporal processes that consider a variety of human and environmental factors. Based on this paradigm, food security must be implemented in four key areas; food availability, accessibility, utilization, and stability (Djan, 2023).

Millions of people worldwide suffer from hunger and under-nutrition. It estimated that between 691 and 783 million people in the world faced hunger in 2022. Considering the midrange (about 735 million), 122 million more people faced hunger in 2022 than in 2019, before the pandemic of COVID 19 (FAO *et al*., 2023).

2.3 Food Insecurity Issues in Urban Areas

In 21st century, change in population is the biggest issues in the worldwide, which is the case of food and nutrition communities, prioritize its study. The causes of the ongoing urbanization tend in global development is demographic change (Djan, 2023). Urbanization gives various advantages, like opportunities for economic prosperity, the development of infrastructure, governance, politics, education, social services, and healthcare facilities. However, urbanization has also several problems, including urban poverty, health, food insecurity, and socioeconomic inequities (Jones *et al.,* 2021).

Most of the recent studies revealed that the risk of food insecurity could even be high in urban than in rural areas due to the intra-urban inequalities present in rapidly urbanized countries. In the past, urban population has a distinct advantage of a better nourished than rural population, due to the higher incomes, improved food access and food availability as well as access to health services, potable water and sanitation. However, with continued urbanization and the rapid increase in urban poor there is now a larger population dependent on the most easily available

and inexpensive foods, which are often low nutritious that increasing the risk of malnutrition (FAO *et al.,* 2023).

In developing countries, the rural-urban migration of many young people is increased for the sake of work in cities. They are considering that there is no farming in the future and better prospects in the urban area, while quite the reverse is true (Teshager, 2020).

2.4 Empirical Literature

The urban food security is affected by several factors, either negatively or positively at household level. However, the empirical literature on determinants of urban food insecurity in Ethiopia is very limited. Until now, no any study undertaken in Burayu town, Sheger city, Oromia region regarding urban household food insecurity. As a result, the relevant literatures reviewed and discussed at micro-level as the following.

2.4.1 Determinants of food insecurity in urban Ethiopia

Desolign *et al*., (2023) used binomial logistic regression model to analyses the determinants of household food security in Amhara region. The researcher based on the survey data from 365 systematically selected urban household heads to generate the result of the study. The study shows sex, house ownership, income, marital status, remittances, and credit services are significantly affect household food insecurity.

In northwestern Ethiopia, Debre-Markos city and Gozamin district, the binary logistic regression model is applied to examine determinants of food security among households. The Survey data is collected from 492 households. The finding revealed that, age, education, marriage, membership in health insurance, training on business development and harmful practices, gender equality and child protection, loan access from self-help groups and small ruminant availability are significantly associated with the household food security of self-help group members. As well as, health insurance membership, electrical appliances availability, and ornaments ownership are significantly correlated with the household food security (Adane *et al.,* 2023).

According to Aschalew and Ayalneh in (2009), the studies identify the determinants and extent of food insecurity in Dire Dawa town is based on 200 primary data collected from the town. The study is used a binary logit model to identify the relationship between the dependent and independent variables. The result of the finding shows, sex (gender) of the heads, family size,

income per day and proportion of food expenditure, household heads educational level, access to credit, and marital status of the heads were significantly determine food insecurity.

The study attempted to examine the food insecurity situation and identify the determinants of food insecurity in Addis Ababa, Ethiopian capital city at household level is used the primary data source collected from 140 households by three stage cluster random sampling. In the study both descriptive statistics and Tobit regression model is used. The result of the study revealed that family size; family income, age of heads, household head education, ownership of bank account and income from remittance and gift are the significant determinants of food insecurity (Sisay and Edriss, 2013).

In 2009, Forum for Social Studies (FSS) investigated a qualitative study in Lideta Sub-city of Addis Ababa, Ethiopia, on the state, causes and impact of household food insecurity, as well as their coping strategies. The result of the study shows that food consumption among the poor households that it covered had declined to very low levels over the last several years. The impact of reduced food consumption in terms of amount and quality includes food price increase and other basic commodities, job loss, unemployment, pre-existing poverty, investment decision of the family and contraction of demand for the services and goods (Amare, 2010).

Dinku *et al.,*(2023), investigated to measure the food security status of the urban households in Dessie and Combolcha cities of north-central Ethiopia. Primary data was collected randomly from 506 households of the town. To collect the quantitative data the researcher used pre-tested and semi-structured survey questionnaire as well as key informant interview, and focus group discussion were used to collect secondary data from system facilitators and actors. In the analysis of the data, Household Food Insecurity Access Scale (HFIAS) was used to measure the food security status, table and summary statistics to analyze the qualitative data, and binary logistic regression analysis is also used to assess the association between independent and outcome variable. The result revealed, gender, participation in casual labor, and living in house ownership is significantly affecting food insecurity.

In Southern Ethiopia, the study was investigated to analyses the magnitude of food insecurity and correlated factors with food security status of the households in Areka town by using randomly collected 309 from urban households in the town. To collect the data, administered

interview and pre-tested structured questionnaires were used. Binary logistic regression analysis was used to assess the association between independent and outcome variable. The result shows that, above 60 years age group and lack of formal education by the head, poverty and less monthly household expenditure for food consumption are factors that significantly contributed to urban food insecurity (Samuel *et al.,* 2021).

Tariku and Mulatu, (2023), the study investigated to assess the vulnerability of food insecurity and determinant factors among households in Waliso town, Oromia, Ethiopia. A community-based cross-sectional study design is used from 397 randomly selected households in Waliso town. The study participants selected using a simple random sampling technique and collected by using a structured questionnaire. To analyses the factors correlated with household food insecurity, multivariable binary logistic regression analyses was done. The result of the study shows revealed, large family sizes, a high family dependency ratio, unemployment, low wage employment, and a low wealth index are significantly associated with food insecurity.

In central Ethiopia, the study was conducted to assess food insecurity and hunger status among households (HHs) in town. The study used a community-based cross-sectional data that collected by a simple random sampling technique from 395 households for the study. To collect the data an interviewer-administered, structured, and pretested questionnaire were used. The data was assessed by using the Household Food Insecurity Access Scale and the Household Hunger Scale, respectively. To identify factors associated with food insecurity, logistic regression analyses is used. The result revealed that, the occupation of the husband, and the educational status of wife, determine the household food insecurity (Takele and Getachew, 2023).

In the southern Ethiopia, the study is investigated in wolaita sodo town to investgate the level of urban household food insecurity and correlated factors among households. The study was conducted based on across sectional type data, collected from 609 households by multistage sampling and multivariable logistic regression model to the analyses of the data. The results of the research show that, the household food insecurity is high in the study area compared to urban national level. The daily laborers of heads, single household head, having high dependence ratio, and low monthly food expenditure were significantly associated with household food insecurity

in positive direction. Otherwise, higher monthly income significantly related with household food insecurity in inverse direction (Abraham *et.al*., 2015).

2.4.2 Household coping strategy in urban Ethiopia

Birhane *et al.* (2014), Ethiopia is one of the developing countries that sustained high food prices, urban poverty, and a high growth rate urban population were experienced. The study was used a community based cross-sectional data that collected from 550 households from three sub-cities of Addis Ababa by using three-stage sampling methods structured questionnaire that based on interview with the heads. To assess the data multiple logistic model was used to identify determinants of household food security. The results of the study revealed households with severely food insecure households scores the lower dietary diversity and were consume low quality diets. Reduction in meal size and shifting to poor quality food types were among the common coping strategies to high food price used by households.

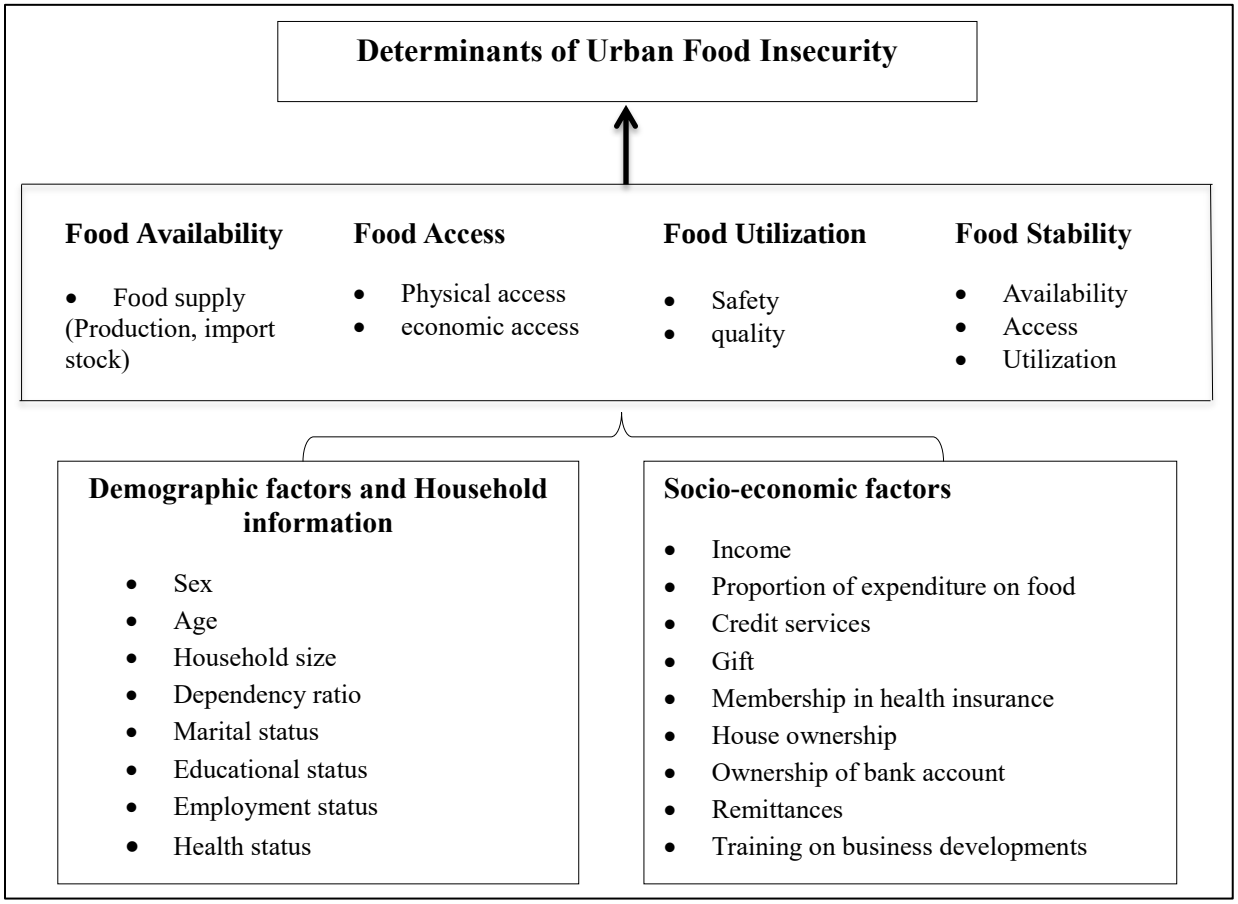
The study conducted in Gelan city of Oromia region indicated, majority of the households use dietary change such as consuming less preferred or less expensive food as a coping strategy as a response to mild food shortages. Purchase food with loan received either from their relatives, friends or neighbors as well as borrowing food items from local shops and neighbors were also commonly adapted. At extreme conditions, begging and skipping out the whole day without consuming any food at least for a day in a week were applied in the town (Solomon, 2021).

According to Teshager (2020), in Ethiopia, the households devise their own coping strategy when faced with different social and natural problems. More than quarters of the households limit the quality and rely on less preferred food to eat when they faced the risk of food insecurity. Some of the households with severe food insecurity problem have to go out for help from someone or even could go the whole day and night without eating anything.

In general, in the reviewed literatures, most of the Ethiopian researchers were used a single method measurement like kilocalorie food intake to measure food security status of the households, but it is not sufficient to measure all food security dimensions. The independent variables such as Income, expenditure, education, age, family size, house ownership, sex, marital

status, remittance, gift, health status, access to credit, employment status, membership in health insurance, and training on business developments are the theorized and considered variables in the studies. Further, there are variables that are not the part of the studies interest. Thus, they are expected to be controlled throughout the study due to their effect on household food insecurity could not be overlooked.

3.5 Conceptual Framework of the Study



Source: own design, 2024

Figure 1: Determinants of Urban Food Insecurity

CHAPTER THREE: RESEARCH METHEDOLOGY

4.1 Description of the Study Area

The study is conducted in Burayu town, Sheger city in Oromia Regional state of Ethiopia. The location of Burayu town is in the west 15 km from the capital city of Ethiopia Addis Ababa and the projection of an estimated total population of the town is 106,582 (ESS, 2023). The weather conditions of the town are highland and semi highland with an average altitude of 2580 m above sea level. The residence of the town largely depends on trade and employment both in government and NGOs. The current urban plan of Sheger City Administration encompasses Burayu town into six kebele, namely Leku Keta, Burayu Keta, Burayu Gefersa, Melka Gefersa, Gefersa Nono, and Gefersa Guje.

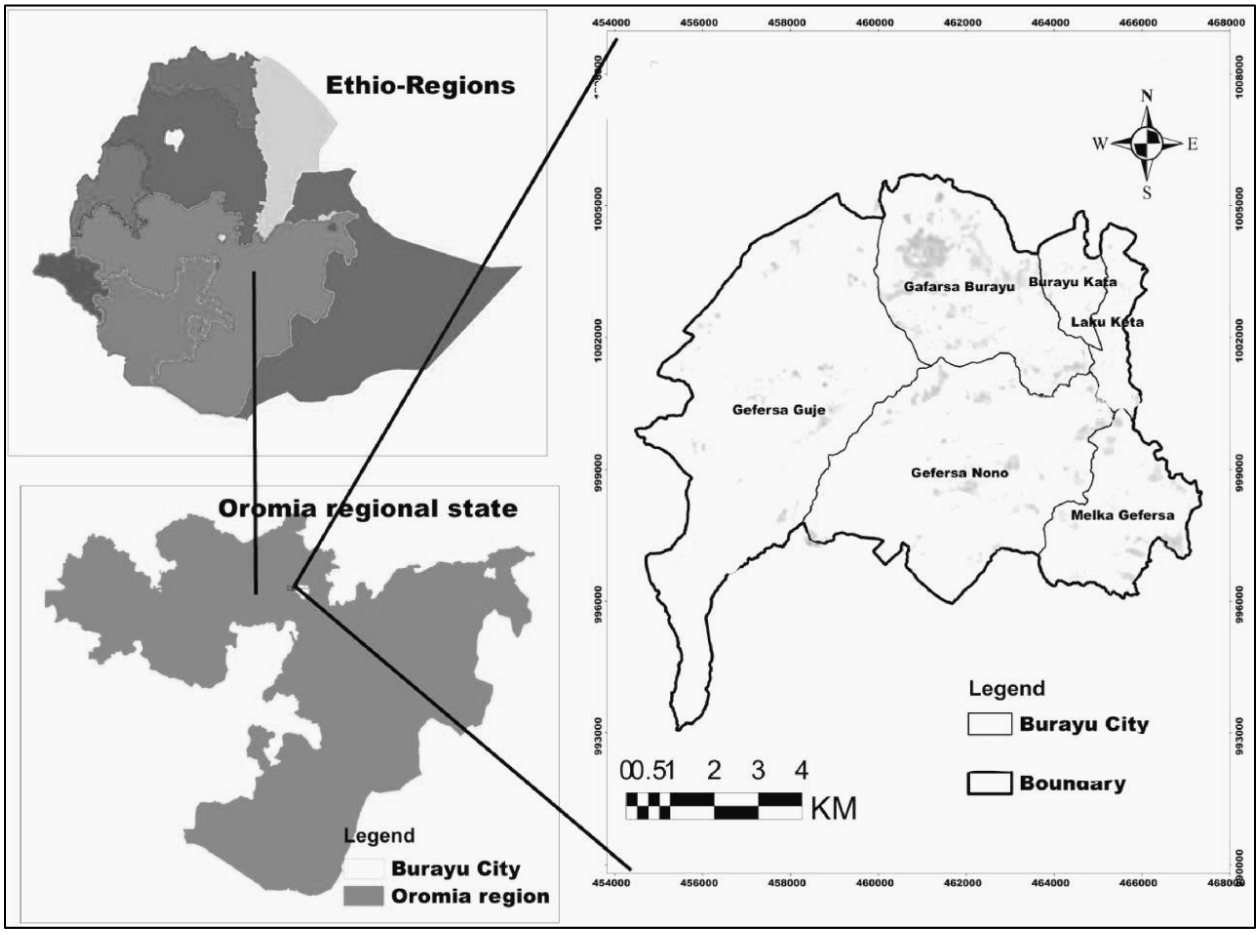


Figure 2 Map of Burayu town

3.2 Research Design

In order to conduct the study a cross-sectional data type based study design was used. To identify the determinants of food insecurity, the households in Burayu town were used as a target population.

3.3 Data Sources, Types and Data Collection Method

Both primary and secondary data types and sources were used for the analysis and interpretation of the determinants of food insecurity in the study area. To collect the Primary data, structured questionnaires and observation method were used to assess physically available information in the study town. In addition, the secondary data was collected from both published and unpublished documents.

3.4 Sampling Design

In order to collect reliable and representative sample from the target population of the Burayu town, a two-stage sampling method was used. In the first stage, the four kebele (Gefersa Burayu, Melka Gefersa, Gefersa Nono, and Gefersa Guje) were chosen by random sampling method from six kebele. In the next stage, the researcher utilizes the probability proportion size (PPS) to obtain the representative sample size of each kebele. Next, the scientific Yemane formula is utilized to determine the total sample size from the total 11239 households with the desired level of precision (Yemane, 1967). Finally, after the sample size of each kebele properly determined, 386 total sample size of the household was collected by chance from each kebele.

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

Where;

N = population size,

1= constant

e = level of precision or error margin of the sampling, which is 5%

n = sample size

$$\mathbf{n} = \frac{11239}{(\mathbf{1}+11239(\mathbf{0.05})^{\mathbf{2}})} = \mathbf{386}$$

After the sample size is determined, the researcher is use the following formula to determine sample size of each kebele.

$$N = \frac{\text{Total Number of Households at each Kebele} * \text{Sample size}}{\text{Total number of Households in the town}}$$

Table 1: The sample size of each kebele

No	Name of Kebele	Number of households	Formula to assign samples	Sample of each Kebele
1	Gefersa Burayu	2,475	2,475*386/11,239	85
2	Melka Gefersa	3,203	3,203*386/11,239	110
3	Gefersa Nono	2,911	2,911*386/11,239	100
4	Gefersa Guje	2,650	2,650*386/11,239	91
	Total			**386**

Source: Burayu town Development Office, 2023

3.5 Methods of Data Analysis

In the analysis of this study, the researcher used both descriptive statistics and econometrics model.

3.5.1 Descriptive statistics

Descriptive statistics such as frequencies, tables, and percentages are used for data presentation, as well as inferential statistics such as Chi-square and T-test was used to show the relationships or differences.

3.5.2 Measurement of food security

To catch all food security dimensions, a single measurement method could not work. According to Solomon *et al.* (2021), HFIAS, CSI, and DDS indicators in combination can help to measure entire four dimensions of food security. Therefore, the three indicators HFIAS, CSI, and DDS were used.

3.5.2.1 Household Food Insecurity Access Scale (HFIAS)

The Household Food Insecurity Access Scale (HFIAS) and Household Food Insecurity Access Prevalence (HFIAP) are focused on the access aspect of food insecurity dimension. HFIAS is used to rank the households from complete food secure (0 scores) to completely food insecure (27 scores) based on a set of standardized questions. A higher HFIAS score represents inadequate access to food and lower HFIAS score refers to less food insecurity (adequate access to food). HFIAP is used to measure all households' food insecurity level by ordinal measures with the categories such as food secure, mildly food insecure, moderately food insecure, and severely food insecure (Coates et al., 2007). Therefore, if at least one question is responded by households' positively to one of the eight items, then the household was determined to be food insecure (Solomon, 2021).

3.5.2.2 Household Dietary Diversity Score

The Household Dietary Diversity Score (HDDS) is developed by FANTA that counts the number of different kind's food groups consumed by the household over a certain period of time (Swindale and Bilinsky, 2006). HDDS is the most commonly method used to measure the economic capacity of a household to access different kinds of foods (Solomon, 2021).

3.5.2.3 Coping strategy index

The Coping strategy index (CSI) is an indicator that used to assess the extent to which households use harmful coping strategies when they do not have access to enough food (Maxwell *et al.,* 2003). In this study, the CSI was used since it helps to obtain detailed information about the food security situation (Maxwell, 2008 and Bogale, 2021).

3.5.3 Econometrics model

3.5.3.1 The Binary Logistic Regression Model

A binary logistic regression model is used to identify the determinants of household's food insecurity. Such a model is suitable if the dependent variable is dummy variable. Based on the dichotomous response variable, the survey data is analyzed by using binary logistic regression. According to Gujarati (1995), the binary logistic regression model is represented as:

$$l_n\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_i\, x_i$$

Where; pi = the probability that Y = 0 (that a given household is not food secured);

$1 - pi$ = the probability that Y = 1 (that given household is food secured);

ln = the natural log of the odds ratio or logit;

β_0 = the intercept or the value of the log odds ratio, ($\frac{pi}{1-pi}$ when explanatory variable is zero)

β_i = the slope that measures the change in L (logit) for a unit change in explanatory variables x_i=lists of explanatory variables included in the study

3.6 Description of the Variables

3.6.1 Dependent variable

This study is focused on the determinants of household's food insecurity. Therefore, the dependent variable is dummy variable, coded as food secure (1) otherwise food insecure (0).

3.6.2 Independent variables ($\boldsymbol{Xn}$)

The common predictors that are expected to influence urban household food insecurity in the study area are listed as the following.

Gender (sex) of household head: Male-headed households have more access to job opportunities and business entrepreneurs as compared to female-headed households. Female-headed households most of the time spent on nonproductive and reproductive activity. Sex of household head is an important determinant of food security and it is a dummy variable (i.e. 1 if it is male and 0 otherwise) (Dinku *et al.,*2023).

Age of household head: It is a continuous explanatory variable and measured by years. As the age of a household increases, it is assumed that employ or business owner could acquire more knowledge and experience. They are more risk averter and their chance to become more food secure increases with age (Girma, 2012). On the other hand, the older age above 50 years age groups household heads is negatively associated with food security. It is positively or negatively related to household's food security (Samuel *et al.,* 2021).

Household size: It is a continuous explanatory variable. It is an important variable that determines the state of household food insecurity. The expected impact of the variable on household food security is negative or positive (Tariku and Mulatu, 2023).

Dependency ratio: It is a continuous explanatory variable and negatively associated with household food security (Abraham *et.al*., 2015), and (Tariku and Mulatu, 2023).

Marital status of the household head: It is a dummy variable coded as if Married = 1, unmarried = 0, and it is negatively or positively related to household's food security (Abraham *et.al*., 2015).

Employment Status of the household Head: It is a dummy variable work on a specific engagement on both employed and self-employed that to generating income. It is coded as if unemployed = 0 and 1if employed (Welteji *et al.,* 2017) and (Moges, 2019).

Education level of household head: It is a continuous variable that measured by years enrolled. Education is an important variable that determining household food security, where the educated households can manage their business or employees as well as they have entrepreneurial ability to their business. However, it has positive effects on household food security (Moges, 2019), and (Takele and Getachew, 2023).

Access to credit: Credit serves as a means to boost production and expand income-generating activities. It is a dummy variable taking the value 1 if the household takes credit and 0 otherwise. Thus, a household that has access to credit does initiate investment in business and achieve food security. It is positively associated with a household's food self-sufficiency (Godefey, 2017) and (Moges, 2019).

Income: It is a continuous explanatory variable that the data includes cash or money income as well as income in-kind from rental, unpaid goods and services, and unpaid food and beverages. The sign for the relationship is expected to be positive which more income has the probability of food secure (Abraham *et.al*., 2015).

Market: It is a dummy variable to their perceived to have access to food items in the market (i.e. if accessed, 1, and 0, otherwise). The availability of food in the market has a positive relationship to urban household food security status. Thus, the availability of food in the

nearest market has a positive relationship to household's food security (Mohamed, 2017) (Moges, 2019).

House ownership: House ownership is one of attribute that makes household more food secure. The ownership of house is positively related with household's food security (Dinku *et al.,*2023).

Aid: The existence of emergency programs, gifts from persons and non-government organizations are create access to food availability for vulnerable households. Therefore, households received food commodities would fulfill their food gap needs. Aid has a positive association with household's food security (Sisay and Edriss, 2013).

Food Expenditures: In urban Ethiopia, there is rapid food price increase, during this time poorer households are more affected by rapid rising food price, and the share of their food expenditure are negatively related to household's food security (Moges, 2019), and (Samuel *et al.,* 2021).

Table 2 summary of variables

Dependent Variable	Food Insecurity		
Independent variables	**Data type**	**Expected sign**	**References**
Sex	Dummy	+, -	(Dinku *et al.,*2023)
Age	continuous	+, -	(Samuel *et al.,* 2021)
Family size	continuous	+, -	(Tariku and Mulatu, 2023)
Dependency ratio	continuous	-	(Tariku and Mulatu, 2023).
Marital status	Dummy	+, -	(Abraham et.al., 2015
Education	continuous	+	(Takele and Getachew, 2023).
Employment status	Dummy	+	(Welteji et al., 2017) and (Moges, 2019)
Income	continuous	+	(Solomon, 2021)
Expenditure	continuous	-	(Moges, 2019), and (Samuel et al., 2021)
House ownership	Dummy	+	(Dinku et al.,2023)
Access to credit	Dummy	+	(Godefey, 2017) and (Moges, 2019)
Access to market	Dummy	+	(Mohamed, 2017) (Moges, 2019)

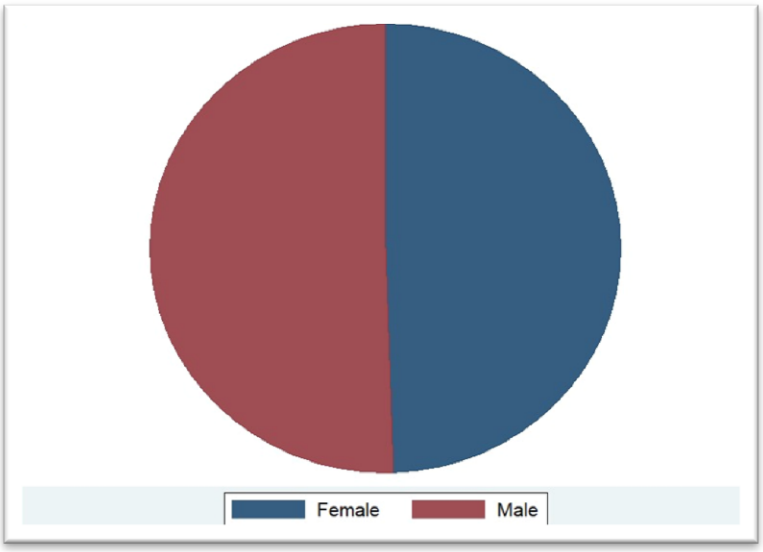
Source: reviewed literature, 2023

CHAPTER FOUR: RESULT AND DISCUSSION

In this chapter the results of the determinants of food insecurity is generated from both primary and secondary data collected from the households of Burayu town, Sheger City Administration, Oromia Regional State of Ethiopia. Under this chapter food security status of the households, categorization of food insecurity, descriptive statistics and logistic regression out puts, DDS and CSI results were included and interpreted.

4.1 Demographic Characteristics of Burayu Town Households

The demographic characteristics of the Burayu town indicated, the questionnaire for the determinants of food insecurity was filled by 49.5% (percent) of the heads were female and 50.5% (percent) were male headed households (see Figure 2). The marital status of the survey suggested that, 34.7% (percent) of the households were unmarried and 65.3% (percent) were married. Accordingly, the average age of household heads from the surveyed data was 32.08 with a standard deviation of 10.7 and the maximum and minimum age of the heads was 80 and 18 respectively. Regarding to the family size, the mean of the Burayu town family size from the surveyed data indicated 3.9 (see Table 3).



Source: Own Survey, 2024

Figure 3 Graph of gender household heads

Table 3 survey data of age of the household heads and family size

Variables	Observation	Mean	Std. Deviation
Age	386	32.08	11.22
Family size	386	3.9	3.33

Source: Own Survey, 2024

4.2 Food Security Status of the Burayu town Households

To assess the status of the households' food security, Household Food Insecurity Access Scale (HFIAS) method is considered. The result of HFIAS score shows that 8.2 averages, 0 minimum, and 25 is the maximum value. By percentage about 18 percent of the households are score zero, that indicated there is no any anxiety, and 3 percent of the respondents are worry about food due to lack of income and resources while they are considered as food secured. To the contrary, about 79 percent of the households are those who at least responded one question "yes" out of eight indicators of food insecurity experience scale model with varying degrees are considered to be food insecure households (see Table 4).

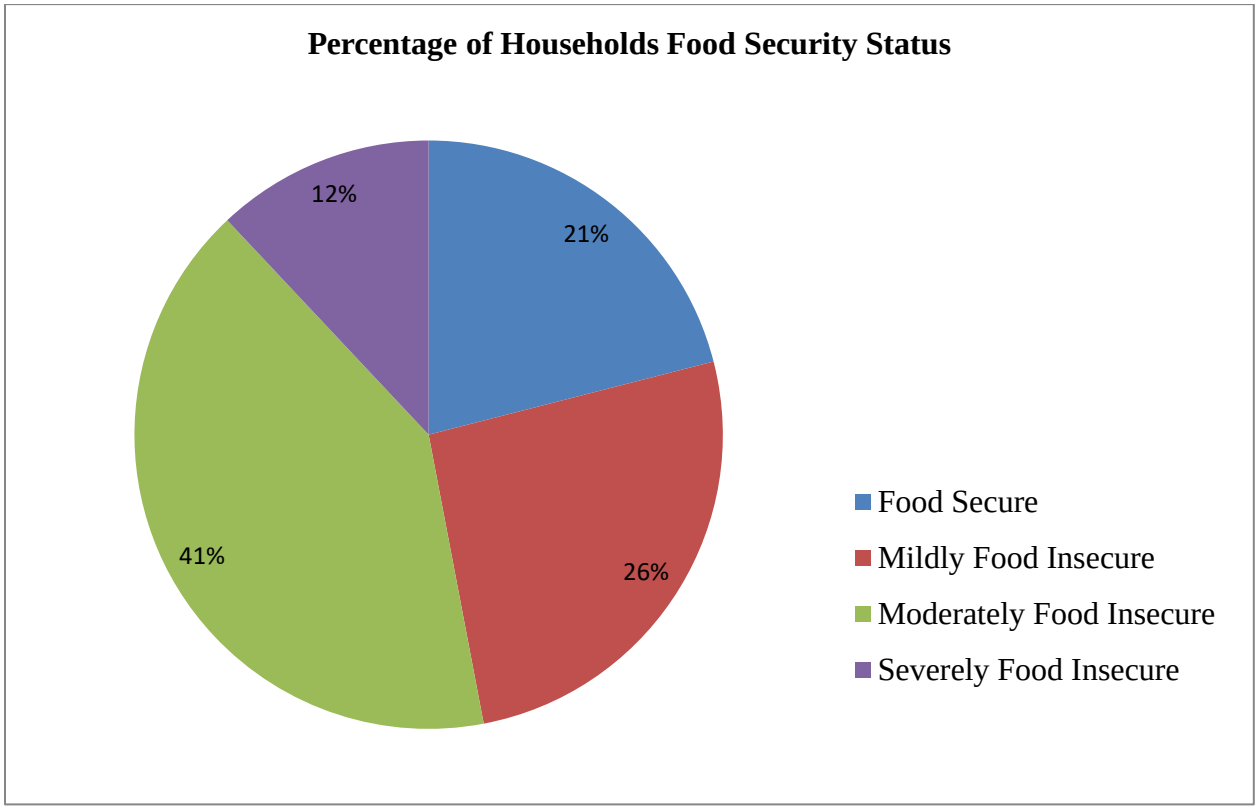
Table 4 Household response in the past four weeks due to lack of money or other resources

Questions	Yes response		Frequency in a month		
	N	Percentage (%)	1-3 times	3-10 times	More than 10 times
Q1: Worry about food	318	82	110	118	90
Q2: Unable to eat preferred foods	296	76	135	129	32
Q3: Eat a few kinds of foods	296	76	163	105	28
Q4: Eat foods they do not want to eat	239	61	120	96	23
Q5: Reduce amount of meal	259	67	145	86	28
Q6: Reduce frequency of meal	230	59	202	16	12
Q7: No any kind of food in the household	165	42.7	112	35	18
Q8: Go to sleep hungry	164	42.4	111	41	12
Q9: Whole day without eating	140	36.2	108	21	11

Source: Own Survey, 2024

4.3 Households Categorization of Food Insecurity

Based on the household Food Insecurity Experience Scale (FIES) the food insecurity status was categorized into three extents which are mild, moderate and severe food insecure. The result of FIES shows that, about 26 percent were mildly food insecure, 41 percent moderately food insecure, and 12% (percent) severely food insecure (see Figure 3). The result of this model indicated that, the majority of households about 79 % (percent) in the town were in the risk of food insecurity.



Source: Own Survey, 2024

Figure 4 Percentage of household's food security status

4.4 Factors Associated with Food Insecurity

The factors such as sex of household head, age of the household head, and educational status of the household head, family size, and dependency ratio as well as households' monthly income, asset ownership, remittance, access to credit, and food aid were found to be significantly associated with food security status of households.

Table 5 Food security and continuous variables

Variables	Food Secure		Food Insecure		t-value
	Mean	**Std. deviation**	**Mean**	**Std. deviation**	
Age	34.79	10.28	29.37	11.21	3.91
Family size	3.2	1.8	3.9	3.6	-2.11
Dependency ratio	1.69	0.95	2.53	1.73	-2.78
Income	20638	14683	7591	6720	10.83
Food expenditure	16612	13262	7195	6960	8.68

Note: ***, **Significant at 5% probability level

Source: Own Survey, 2024

Age of the household heads: The association between household heads age and food security status of the study area is described in (Table 5). The average age of the food secure household heads in the study area is 34.79 years (SD=10.28) and 29.37 years (SD=11.21) for food insecure households. Therefore based on the result, most of food insecure households in the study area are below 30 years and the food secure households are above 30 years. Thus, the finding of this study revealed that age of the household head is positively related to household's food security. As the age of heads increases, it is assumed that employ or business owner could acquire more knowledge and experience. In line with this study, the heads are more risk averter and their chance to become more food secure increases with age (Girma, 2012 and Samuel *et al.,* 2021).

Family size: Family size is an important variable that determines the state of household food security. According to Tariku and Mulatu, (2023) the food insecure households have large family size than food secure households. In this study, family size is significant at 5% and negatively associated with food security status. Table 5 illustrates the average of the family size in the study area show that 3.2 for food secure and 3.9 for food insecure. This result suggested that families have a fewer number of family size may have a better opportunity to become food secure than those who have many members. For the households have a large family size it is not simple to cover the demand of their family food items and different expenditures with current high cost of living.

Dependency Ratio: Dependency ratio is the percentage of the total number economically inactive family members those less than 15 years and greater than 64 years out of the total number of active age groups (15-64). Therefore, it is an important variable that have an impact on food security status of the households. Table 5 suggests the relationship between dependency ratio and food security status of the households is significant at 5%. The mean of the dependency ratio of the study participants is 1.69 (SD=0.95) for food secure and 2.53 (SD=1.73) for food insecure households. Therefore, the finding revealed that the dependency ratio have a negative relationship with the household food security status. Otherwise, a high dependency ratio is associated with food insecurity, indicated a high dependency is a burden to achieve food security to the households. Dependency ratio is negatively associated with household food security (Abraham *et.al*., 2015; Tariku and Mulatu, 2023).

Household income: Income of the household is the major factor affecting the food security status of the households. The households in the urban areas are needed to have the financial capacity to purchase food and non-food items at required quantity and quality. Table 5 revealed, the average monthly income of the food insecure household is ETB 7591 and for food secure households their monthly income is ETB 20638. Therefore, the study showed that income is positively related with household food security status significantly at 1% level. It indicates the households with higher income have more opportunities to achieve food security. Thus, households with higher income levels could have ability to recipe a nutritious and quality food. In contrast, the households with low income could only purchase limited, less nutritious, and cheaper foodstuff. Similarly, the lower monthly income household families (in association with food price inflations), and increased costs of living they are more vulnerable to food insecurity in urban areas (Tadele, 2019 and Solomon, 2021).

Food Expenditure: In urban area, there is rapid food price increase, during this time poorer households are more affected by rapid rising food price, and the share of their food expenditure are negatively related to household's food security (Moges, 2019), and (Samuel *et al.,* 2021). Table 5 suggested that the mean of monthly food insecure household expenditure is 7195 and 16612 is the average monthly income of food secured household groups. Therefore the result of the study and FGD rise the share of their food expenditure is very high to due to food price increase time to time and it is negatively affect food security status of the households.

Sex of the household heads: Gender of the household head is an important determinant of food security where male-headed households have more access to job opportunities and business entrepreneurs as compared to female-headed households. Female-headed households most of the time spent on nonproductive and reproductive activity (Dinku *et al.,*2023). In this study the percentage of the total observation of the household head by gender is 50.5 percent male and 49.5 percent female. From the food insecure groups, female households account for 55.6 percent and male households account for 44.4 percent. In contrast, in food secure group, female and male headed household's account for 26.25 and 73.75 percent respectively. This result suggested that there is a significant variation among food secure and food insecure households due to the gender of the household heads (see Table 6). Therefore, compared to male headed households, female headed households are more food insecure.

Table 6 sex of household and food insecurity relationship

Sex of household head	**Food Secure (N=80)**	**Food Insecure (N=306)**	**Total**	χ^2 **value**
	Percent	Percent	percent	
Female	26.25	55.6	49.5	
Male	73.75	44.4	50.5	21.79***
Total	100	100	100	

Note: *** Significant at1% probability level

Source: Own Survey, 2024

Marital Status of the heads: The marital status of the household is one of the indicators of food security status. Table 7 suggested that, 20% (percent) of the food secure households are unmarried and 80 percent of food secure households are married. From food insecure households 38.6 percent are unmarried and 61.4 percent are married. Therefore, the result shows that unmarried households are more vulnerable to the food shortage than married households. Thus, the marital status and food security status is positively and significantly related at 5%. Abraham *et.al*. (2015), suggested that marital status is positively related to household's food security.

Table 7 Food security status and marital status

Marital Status of the Household head	Food Secure (N=80)	Food Insecure (N=306)	Total (386)	χ^2 value
	Percent	Percent	percent	
Unmarried	20	38.6	34.7	
Married	80	61.4	65.3	9.64**
Total	100	100	100	

Note: ** Significant at5% probability level

Source: Own Survey, 2024

Educational Status of the household heads: Educational level of household heads is one of the factors that determine the status of household food security. The heads that have higher education have the opportunity to choice of work, and have high productivity compared to the heads that have low education (Solomon, 2021). The relationship between educational level of the household heads and food security status are suggested in (Table 8). It indicated that, the household heads with low educational level are more vulnerable to the state of food shortage, and vice versa. It is because of the head of the family with higher educational level have access to higher-income jobs such as employees in governmental organizations or NGOs, while most household heads have low educational levels are work in the informal sector such as daily and weekly laborer. Education is an important variable that determining household food security, where the educated households can manage their business or employees as well as they have entrepreneurial ability to their business. However, it has positive effects on household food security (Moges, 2019;Takele and Getachew, 2023).

Table 8 Education of the household heads and food security

Educational Status of the Household head	Food Secure (N=80)	Food Insecure (N=306)	Total (386)	χ^2 value
	Percent	Percent	percent	
Illiterate	0	6.5	5.2	
Reading and writing	7.5	20	17.4	
Primary school	26.25	22.5	23.3	14.01**
Secondary school	27.5	20.6	22	
Higher education	38.75	30.4	32.1	
Total	100	100	100	

Note: ** Significant at5% probability level

Source: Own Survey, 2024

Employment status of the household heads: Employment status of the household head is one of the most important factors positively associated with food security status. It is an engagement on both employed and self-employed households to generating income (Welteji *et al.,* 2017) and (Moges, 2019). Table 9 showed that, from food secure groups 95% (percent) of the households are employed and only 5% (percent) of the households are unemployed. Otherwise from food insecure groups 26.1% (percent) are unemployed and 73.9% (percent) of the households are employed. Therefore, the result revealed employment status of the household is positively related to food security status and statistically significant at 1%; due to most of food secure households are employed in self or other sectors.

Table 9 Food security and Employment status of the heads

Employment status of the Household head	Food Secure (N=80)	Food Insecure (N=306)	Total (386)	χ^2 value
	Percent	Percent	percent	
Unemployed	5	26.1	21.8	
Employed	95	73.9	78.2	16.65***
Total	100	100	100	

Note: ***Significant at1% probability level

Source: Own Survey, 2024

House ownership: House ownership is one of attribute that makes household more food secure. The ownership of house is positively related with household's food security (Dinku *et al.,*2023).

Table 10 revealed that from food secure families above 43 % households are lived in their own house and from the food insecure side only 33.4 % households are having their own house. Therefore, the result suggests house ownership is significantly and positively associated with food security status of the households.

Table 10 House ownership and food security

House ownership	**Food Secure (N=80)**	**Food Insecure (N=306)**	**Total (386)**	**χ^2 value**
	Percent	Percent	percent	
Owned	43.75	30.7	33.4	
Rented/others	56.25	69.3	66.6	8.13**
Total	100	100	100	

Note: ** Significant at5% probability level

Source: Own Survey, 2024

Remittance: Remittance refers to economic support from relatives in terms of money sent to the households from abroad. However, the result shows 23.75 percent of the food secure households receive remittance from abroad and 9.15 of the receive remittance from food insecure groups. Therefore it is statistically significant at 1% variation in remittance received between food secure and food insecure households (see Table 11). Thus the remittance that received from abroad is positively associated with food security status of the households in the study area. It gives the opportunities to the households to purchase required amounts of food in terms of quantity and quality.

Table 11 Remittance and food security

Remittance	**Food Secure (N=80)**	**Food Insecure (N=306)**	**Total (386)**	**χ^2 value**
	Percent	Percent	percent	
Not received	76.25	90.85	76.4	
Received	23.75	9.15	23.6	170***
Total	100	100	100	

Note: ***Significant at 1% probability level

Source: Own Survey, 2024

Access to market: Access to market can create an opportunity for the urban households to get available quality and quantity of food to their nearest. The availability of food in the market has a positive relationship to urban household food security status. Thus, the availability of food in the nearest market has a positive relationship to household's food security (Mohamed, 2017) and (Moges, 2019). Table 12 indicated the market access and food security status in the study area is significantly and positively associated. The result of the study show that 49.75 percent of the food secured households and 64.1 percent of food insecure households can access the nearest market.

Table 12 Access to market and food security

Access to Market	Food Secure (N=80)	Food Insecure (N=306)	Total (386)	χ^2 value
	Percent	Percent	percent	
Not accessed	51.25	35.9	39.12	
Accessed	49.75	64.1	60.88	6.23***
Total	100	100	100	

Note: ***Significant at 1% probability level

Source: Own Survey, 2024

4.5 Determinants of Food Insecurity

Table 13 represents the output of binary logistic model, demographic and socioeconomic factors are the factors expected to determine the food security status of the Burayu town households. Before the interpretation of the result, first check the validity of the model is important. In order to check the goodness of fit of the model Hosmer and Lemeshow (H&L) tests were used. The test result ($\chi 2$ (145) = 135.71, P-value = 0.6979) indicates that the model displays a good fit to the data because p-value > 0.05(see Table 17). Furthermore, Nagelkerke R Square (Psuedo R^2 = 0.7524). Thus, the Pseudo R^2 of the model was 75.24% (percent). This suggested that 75.24 percent of the variation of household food security level can be predicted from the combined independent variables included in the model and the remaining 24.76 percent is explained by other variables. Thus, the output of this study revealed that, out of fourteen variables eight variables namely age, dependence ratio, house ownership, income, asset, remittance, education, and food expenditure are significantly associated with food insecurity.

Table 13 Binary logistic regression model output

Variables	Coefficient	Odds Ratio	S.E.	Z	p-value
Gender of household head	0.1567	1.169	0.628	0.23	0.803
Age of household head	-0.1242	0.883	0.328	-3.78	0.00
Dependence ratio	0.776	2.173	0.373	2.08	0.038
Education of household head	-0.6877	0.502	0.393	-1.78	0.081
Employment status of head	-1.8168	0.162	1.659	-1.09	0.274
House ownership	-1.1856	0.305	0.360	-3.29	0.001
Income	-0.00013	0.999	0.00005	-0.10	0.021
Asset	$-2.12e^{-06}$	0.999	$7.13e^{-07}$	-2.31	0.003
No of family generating income	-0.0227	0.977	0.232	-2.97	0.922
Food expenditure	0.00014	1.0001	0.00008	1.65	0.098
Market access	0.9214	2.512	0.710	1.30	0.195
Credit access	0.5235	1.687	0.864	0.61	0.545
Remittance	-3.29	0.037	1.159	-2.84	0.005
Aid	-0.9635	6.381	1.267	-0.76	0.447
constant	12.31	202196	3.251	3.76	0.00
	Number of observation				386
	H &L Test chi2(145)				.6979
	Log likelihood				-41.94
	Pseudo R2				.7524

Note: *, ** and *** significant at10%, 5% and 1% probability level

Source: Own Survey, 2024

4.5.1 Analysis of the significant variables

Age of the household head: The results of the finding revealed that age of the household head has a negative effect on food insecurity status significantly at 1% (percent). The odds ratio 0.883 is the predictor of the model probability of being food secure for every one unit increase in age of the household heads, other factors being constant. As the age of a household head increases, it is assumed that employ or business owner could acquire more knowledge and experience. They are more risk averter and their chance to become more food secure as age increase (Girma, 2012) and (Samuel *et al.,* 2021).

Dependency ratio: The result of this study revealed that the relationship between dependence ratio and food insecurity are statistically significant at 5% (percent). It confirms the association between dependence ratio and food insecurity is direct relation (i.e. the probability to become food insecure is not simple for households with high economically inactive household members and vice versa). Assume other factors being constant, the odds ratio of 2.173 suggested that the probability of being food secure of the household is decreased by 2.173 as the dependent ratio group is increased by one unit. Therefore, the result implies the households with higher dependence ratio family members could be vulnerable to food shortage because of the high economically inactive family member's burden. Thus, the Burayu town households with large dependency ratio members are more food insecure than households with economically active household members. Similarly, different studies result shows the negative relationship between dependence ratio and food security status (Ibrahim, 2016) and (Solomon, 2021).

House ownership: House ownership is negatively and strongly related with food insecurity status at 1% (percent) significant. The finding suggests that the probability of being food insecure is changed by 0.305 odds ratio for every one unit increase in ownership of house of households. The increase in housing ownership will have an inverse effect on food insecurity, because of most of the households are live in rented house. According to Mekonen *et al.* (2023), one of the most severe causes for food insecurity in the town is the highest monthly rental expense that paid for living house with insignificant income earned by the households. Therefore, house ownership is play a significant role by decreasing rental house expenses may change the income capacity of the households.

Income: The result of the finding suggested that household income have an inverse impact on food insecurity. The output of the binary logistic regression analysis indicated, the odds ratio of 0.999 is the probability of the households being to become food secure as household income is increased by one unit, by assuming other factors being constant. Thus, income is one of the most important indicators of food security, since it increases the purchasing power the household to purchase food items. The output of a negative relation between the income of the family and food security in this study is consistent with the different findings (Mekonen *et al.,* 2023).

Asset: The result of the finding indicated that household asset have a negative impact on food insecurity. The output of the binary logistic regression analysis shows, the odds ratio of 0.999 is the probability of the households being to become food secure as household asset is increased by one unit, by assuming other factors being constant. Therefore, asset is one of the most important indicators of food security in the study area.

Remittance: Remittance is money that is received from a relative as aid or gift from abroad. It is inversely and strongly associated with food insecurity statistically significant at 1% (percent). The odds ratio of this study 0.037 is the probability at which the household to become food secure as one household receive remittance. Thus, remittance that received from abroad is negatively and strongly associated with food insecurity status of the households in the study area. It gives the opportunities to the households to purchase required amounts of food items to minimize food shortage.

Educational level of the household heads: Education is one of the factors that determine the status of household food insecurity negatively and significantly at 10%. The odds ratio 0.502 is the probability at which the household to become food secure as one households education level increase by one years. The heads with higher educational level have the opportunity to choice of work, and have high productivity compared to the heads that have low education (Solomon, 2021). It is because of the head of the family with higher educational level have access to higher-income jobs such as employees in governmental organizations or NGOs, while most household heads have low educational levels are work in the informal sector such as daily and weekly laborer. Education is an important variable that determining household food security, where the educated households can manage their business or employees as well as they have entrepreneurial ability to their business (Moges, 2019;Takele and Getachew, 2023).

Food expenditure: In urban area, there is a rapid food price increase, during this time poorer households are more affected by rapid rising food price, and the share of their food expenditure are positively related to household's food insecurity (Moges, 2019) and (Samuel *et al.,* 2021). The result of the finding suggested that household food expenditure have a direct impact on food insecurity significantly at 10%. The result indicated, the odds ratio of 0.999 is the probability of the households being to become food insecure as household food expenditure is increased by one birr by assuming other factors being constant. Therefore the result of the study and FGD rise the share of their food expenditure is very high due to food price increase time to time.

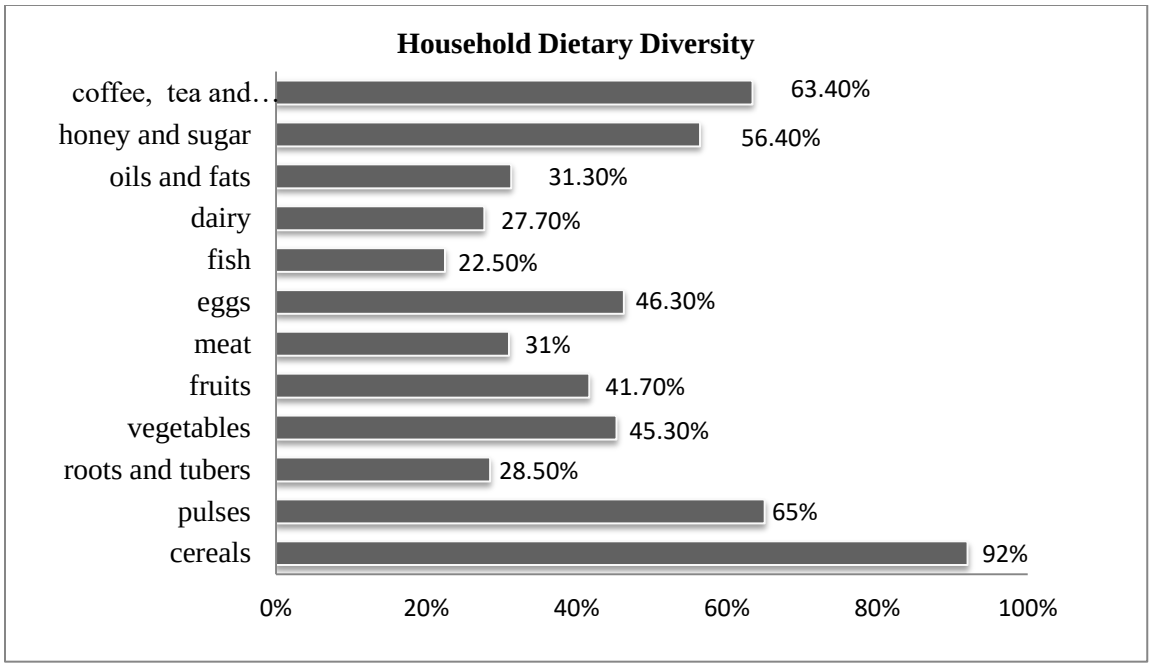
4.6 Household Dietary Diversity Score Status

Household Dietary Diversity (HDD) is used to measure the household ability to access food as well as its socioeconomic status based on the last 24 hours. HDD is the household food security status that determined by the education, age, socio-economic characteristics of the household heads, and the location (Huluka, 2019) and (Solomon, 2021). In this study, the households HDDS mean is 5.33, a minimum 1, and the maximum is 11 (see Table 14). The result of DDS score in the town indicated that, the average score 5.33 shows the Burayu town households access to variety of food group is at a moderate level. But, the severely food insecure households are consume the minimum only one type of food item.

Table 14 Dietary diversity score status of the households

Dietary Diversity Level	Frequency	Percent	Mean	Minimum	Maximum
Low (<5 food groups)	124	32	2.5	1	4
Medium (5 food groups)	82	21	5	5	5
High (≥6 food groups)	180	47	8.5	6	11
Total (1- 12 food groups)	386	100	5.33	1	11

Source: Own Survey, 2024



Source: Own Survey, 2024

Figure 5 Percentage of consumed 12 food kinds in the study area

In Burayu town, large proportions (about 92%) of the households consume the food prepared from cereals like, engera, porridge, spaghetti and others, followed about 65% of pulses and 63.4% of coffee and tea were the majority of the food types that consumed in the area. Additionally, eggs, honey and sugar products, vegetables and fruits were moderately consumed by the households in the study area. Finally, meat, fish, dairy, oils and fats were consumed at less percentage (see Figure 5).

4.7 Dietary Diversity Score and Food Security Status Correlation

The average household dietary diversity score (HDDS) of the study area is 4.75 for food insecure and 8.5 for food secure (see Table 15). The variation in mean of HDDS between food secure and food insecure households is significant 1% (percent) probability level. The output suggested that adequate dietary diversity related with improved food security status or lower HFIAS score of the households. Therefore, the food secure households had the ability to purchase various food groups than the food insecure households. Similarly, Ngema *et al*. (2018) and Solomon (2021) revealed that HDDS associated with determinants of food security such household income and related with HFIAS (the most widely used to measure of food security).

Table 15 Correlation between dietary diversity score and food security status

	Food security status	Frequency	Mean	Std. Deviation	t-value
DDS	Food Secure	80	8.5	0.96	
	Food Insecure	306	4.75	1.49	21***

Note: ***Significant at 1% probability level

Source: Own Survey, 2024

4.8 Household Coping Strategies

The output the study showed that, the average coping strategy index (CSI) of the Burayu town household is 37.3 households (see Table 16). The result suggested that, the households with a high score coping strategy index (CSI) is related with severe food insecure households. Therefore, the food insecure households were employed more severe coping mechanisms than the food secured households to cope-up from food shortages. According to Solomon (2021) food security stats of the households CSI scores were significantly associated.

Table 16 coping Strategy Index of Burayu town households

CSI Level	Frequency	Percent	Mean	Minimum	Maximum
Lower CSI (less than 40)	184	60	22.5	5	39
Medium CSI (40-60)	72	24	43.3	40	58
Higher CSI (≥60)	50	16	75.1	60	104
Total	306	100	37.3	5	104

Source: Own Survey, 2024

4.8.1 Consumption coping strategy

Due to food shortage most of the households change their consumption behavior at family level. In this study all of food insecure households (100%) were applied dietary change to manage the food shortage. Therefore, due to lack of money and resources, about 95% (percent) of Burayu town households were consume less preferred and inexpensive foods (Table 17). The other strategy of the households in the area is by rotating different strategies like about 63.4% (percent) of food insecure households were mange food shortage by limiting the portion of their mail times, 44% (percent) of the households applied restrict the adult consumption to the children's, 63.7% (percent) of families by reducing number of meals eaten in a day and 42.8%

(percent) were skip the entire day without eating any food. Thus, the households who skip the entire day without eating any foods are more food insecure than the households who applied other strategies. Similarly, severely food insecure households prefer to stay hungry to extend consumption days for the small amount of food they had (Solomon, 2021).

Table 17 Consumption coping strategy index

Coping Strategy	**Households' response (percent)**		**Frequency of occurrence (percent)**		
	Yes	No	1-2 days	3-6 days	All days
1. Dietary Change					
• Rely on less preferred, or inexpensive food	95	5	35.3	53	5.3
2. Rotation					
• Limit portion size at mealtimes	63.4	36.6	44.8	42.3	12.9
• Restrict adult consumption	44.8	55.2	53.3	38	8.7
• Reduce number of meals eaten in a day	63.7	36.3	41	46	13
• Skip entire day without eating	42.8	57.2	80.1	16.8	0.03

Source: Own Survey, 2024

4.8.2 Asset and support rely coping strategies

Asset and support are the important resources used by households to overcome the food shortage. The households applied short-term measures to increase household food availability by borrowing food or depend on relatives or friends and purchasing food on credit basis. As well as, the household's used short-term measures to decrease the numbers of people to feed by sending the family members to eat elsewhere or begging across the road. Table 18 indicated that, about 57.5% (percent) of food insecure households practiced borrowing food or depend on relatives or friends and 35% (percent) of the households were purchasing food on credit basis to increase food availability. On the other hand the households practiced 46% (percent) of the families send their family members elsewhere to eat food and 12% (percent) of the food insecure families are send their household members to beg in the community. Finally, about 57.5% (percent) and 43.8% of the food insecure households were applied others strategies rely on aid from outside the family and depend on remittance respectively. Similarly, most of the time the strategy of

sending household members to beg across the road is practiced by severely food insecure households to cop-up food shortage (Solomon, 2021).

Table 18 Short-term coping strategy index

Coping Strategy	Households' response (percent)		Frequency of occurrence (percent)		
	Yes	No	1-2 days	3-6 days	All days
1. Short-term measures to increase household food availability					
• Borrow food or rely on others	57.5	42.5	44.3	35.2	20.5
• Purchase food on credit	35	65	29	56	15
2. Short-term measures to decrease numbers of people to feed	46	54	62	38	-
• Send family members to eat elsewhere					
• Send household members to beg	12	88	18	12	-
3. Others					
• Rely on aid from outside the family	57.5	42.5	51	39	10
• Depend on remittance	43.8	56.2	76.8	21.6	1.5

Source: Own Survey, 2024

4.9 Coping Strategy Index and Food Insecurity Access Scale Association

The coping strategy index (CSI) score is strongly associated with food security status significantly at 1% (percent) probability level. Therefore, correlation between CSI score and the HFIAS indicator was positive and highly significant. The result showed that, the households with high score of CSI relates to sever food insecure households. Thus, the food insecure households practiced more hurting coping strategies than the food secured households to cope-up with food shortages (see Table 19). According to Maxwell (2008) suggested that CSI correlated with determinants of food insecurity such household income and HFIAS (the most widely used to measure of food security).

Table 19 coping strategy index with food insecurity access scale

Coping Strategy Index	**Food Secure (N=80)**	**Food Insecure (N=306)**	**Total (386)**	χ^2 **value**
	Percent	Percent	percent	
No	91.25	0	18	
Yes	8.75	100	82	344.3***
Total	100	100	100	

Note: ***Significant at 1% probability level

Source: Own Survey, 2024

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

5.1 Summary

The finding indicated that, 79 % of the residents in Burayu town were categorized under food insecure and only 21% of the households were food secure. The logistic regression model result indicated that, out of fourteen independent variables eight variables were the determinants of household food insecurity in the study area; Age, monthly income of the family, asset, house ownership and access to remittance, educational level of the households were inversely associated with food insecurity and only dependence ratio and food expenditure were positively related to food insecurity.

The result of CSI suggested that, the Burayu town households practiced negative coping strategies due to lack of income or money to buy food. In the town, large proportion of the households use dietary change strategies like consuming less preferred or inexpensive food to manage mild food shortages. Additionally, rotation of consumption, Short-term measures to increase household food availability (i.e. borrow food and purchase food on credit), Short-term measures to decrease numbers of people to feed (i.e. Send family members to eat elsewhere and Send household members to beg) and others (rely on aid and remittance) are the predominantly practiced CSI to cop-up from food shortage. Finally, the households who practiced begging and skipping the whole day without consuming any food at least for a day in a week were used the harmful coping strategies in the study area.

5.2 Conclusion

This study conducted on the determinants of food insecurity in Burayu town of Sheger city administration in Oromia region. The finding suggested that, most of the residences in the town are more vulnerable to the food shortage.

In the town, above three fourth of the households were categorized under food shortage due to continuous increase in price of food, low educational level of the heads, lack of generating income through jobs or self-employee and lack of house-ownership in Burayu town. Therefore, it needs the intervention of government, policy makers and development actors in Burayu town to arrange and minimize the risk of food insecurity through evidence based programs and addressing the root causes of food insecurity in the town.

Consequently, majority of the food insecure households practiced negative coping strategies in Burayu town to minimize the risk of food shortage. Thus, this study encourages the Sheger city administration and Ethiopian government to give the priority to food insecurity issue in the town.

5.3 Recommendations

Based on the study findings, the following recommendations are recommended for policy makers, community and researchers.

- Dependency ratio was found to be negatively associated with household food security. The families with large dependency ratio have higher probability to be food insecure. As a result, government, health sector and development actors should give awareness to the households to have acceptable number of children through giving training and other incentives.
- The result of the logistic model suggested, income of the households and food insecurity are strongly and negatively associated, so the government sectors and NGOs should encourage the food insecure households through short-term training on business ideas, creating job opportunities like urban agriculture, expanding small enterprises to generate income in the town and they could be able to become food secure.
- The result of the research shows remittance is negatively and strongly associated with food insecurity. Expecting income from remittance and aids are not sustainable for a long time. Therefore, the government (policy maker) should enforce to reduce this dependency through people's entrepreneur and they can generate income by themselves.
- The heads with illiterate and lower educational level should get adult education and short-term vocational trainings on financial, technical and business ideas to empower them to join skill labor and self-employment.
- House ownership is one of the significantly and strongly associated with food insecurity in the study area. Thus, in order to secure this problem the government and the financial sector should facilitate house on credit for instance condominium to those have ability pay and construct like kebele houses particularly for severely food insecure households.
- Finally, further study should be conducted to identify the business opportunities for a long-term in the town in order to stabilize the food shortage problems in all food security dimensions of food security by increasing the household's income.

References

A.M. Dinku, T.C. Mekonnen and G.S. Adilu. (2023). Urban food systems: Factors associated with food insecurity in the urban settings evidence from Dessie and Combolcha cities,north-central Ethiopia. Heliyon 9/ e14482.

Abraham, T.T., Tsegaye, D. G., and Berhanu, K.S. (2015). Household food insecurity and associated factors among households in Wolaita Sodo town. Agriculture & Food Security. DOI 10.1186/s40066-017-0098-4.

Adane, Y., Degefa, T., and Esubalew, A. (2023). Determinants of food security among households organized and non-organized in self-help groups in Debre-Markos city and Gozamin district of northwestern Ethiopia. Journal of Sustainable Development in Africa (Volume 25, No.1,), ISSN: 1520-5509, 141-146.

Amare, Y. (2010). Urban Food Insecurity and Coping Mechanisms A Case Study of Lideta Sub-city in Addis Ababa. Forum for Social Studies (FSS), ISBN 978-99944-50-34-3.

Aschalew, Feleke, and Ayalneh, B. (2009). Determinants and Dimensions of Household Food Insecurity in Dire Dawa Town, Ethiopia. East African Journal of Sciences (2009) Volume 3 (2) 134-141 .

Chris, H. and Sevil, O. (2022, Feburary 22). hunger-news-stories/africa-hunger-famine-facts. Retrieved from world vision: https://www.worldvision.org/hunger-news-stories/africa-hunger-famine-facts

Crush, J. and Riley, L. (2019). Rural bias and urban food security. doi:10.4324/97813151911953.

Cuncic, A. (2023, January 23). What is food insecurity? Retrieved october 22, 2023, from verywellmind.com: https://www.verywellmind.com/what-is-food-insecurity?

Dersolegn, M. Arega, B. B., & Tesfahun, K. (2023). Determinants of Urban food security status athousehold level: The case of Bahir Dar and GondarCities of the Amhara Region, Ethiopia.ISSN:(Print)(Online):https://doi.org/10.1080/23311932.2023.2186209.

Djan, M. A. (2023). Urban Food Security: Examining the Unique Challenges and Opportunities Associated with Ensuring FoodSecurity in Urban Areas. European Journal of Nutrition & Food Safety, 45-46: DOI: 10.9734/EJNFS/2023/v15i91335.

Ejigayhu, S. and Abdi-Khalil, E. (2013). Determinants of Food Insecurity in Addis Ababa City, Ethiopia. Journal of Economics and Sustainable Development. ISSN 2222-XXXX (Online) Vol X, No.X, 2012, 4-6.

ESS. (2023). Ethiopian Statistical Service. Retrieved 11/ 2023, from https://www.statsethiopia.gov.et/population-projectio/ET042001-burayu.

FAO. (1983). World Food Security: a Reappraisal of the Concepts and Approaches. Rome: Director Generals Report.

FAO. (2006). Food Security Policy Brief. FAO Agricultural and Development Economics Division.

FAO. (2008). An Introduction to the Basic Concepts of Food Security. EC - FAO Food Security Programme.

FAO. (2023). GIEWS - Global Information and Early Warning System/FOOD SECURITY /Ethiopia. Retrieved 10 31, 2023, from fao.org:https://www.fao.org/giews/countrybrief/country.jsp?code=eth

FAO, IFAD, UNICEF, WFP and WHO. (2019). The State of Food Security and Nutrition In The World 2019. ©FAO, 2019 CA5249EN/1/07.19. DOI: https://doi.org/10.4060/CA5162EN.

FAO, IFAD, UNICEF, WFP and WHO. (2023). The State of Food Security and Nutrition in the World 2023.Urbanization, agrifood systems transformation and healthy diets across the rural–urban continuum. Rome: FAO/https://doi.org/10.4060/cc3017en.

Georges N.M. Philanthropic, Neo Malthusianism. (2017). The rockefeller foundation and the mexico agricultural program. The Graduate History Review, 6:1906-1945.

GHI. (2023, October). GLOBAL HUNGER INDEX 2023: ETHIOPIA. Retrieved October 23, 2023, from www.globalhungerindex.org: https://www.globalhungerindex.org/ethiopia.

Gujarati. (1995). Basic Econometrics: 4th Edition, United States Military Academy. New York.

Habte, S., Gudina, E., Wondimagegn, P., Tesfahun, Y. B., Minyahil, T. (2021). Food Insecurity and Associated Factors Among Households in Areka Town, Southern Ethiopia. Journal of Health, Medicine and Nursing, ISSN 2422-8419 An International Peer-reviewed Journal, Vol.88, 2021.

Jones, A., Smith, B., Williams, C., Brown, D. (2021). Food insecurity and mortality in urban areas: A systematic review and meta-analysis. The Lancet;398(10297), 1765–1777.

Maurice, M., Moses, W., Ngware, Caroline, W., Kabiru, Ngianga-bakwin K. (2016). The effect of education on household food security in two informal urban settlements in Kenya: a longitudinal analysis. Food Sec. (2016) 8:743–756, DOI 10.1007/s12571-016-0589-3.

Moges, M. (2019). The effect of urban productive safety net project to household food security status in Addis Ababa: a case study from Yeka sub-city woreda 08, Addis Ababa, Ethiopia.

Takele, G. D., and Getachew, T. G., (2023). Household food insecurity and hunger status in Debre Berhan town, Central Ethiopia: Community-based cross-sectional study. Frointers in Nutrition. DOI 10.3389/fnut.2023.1035591.

Tariku, G. T., and Mulatu, A. H., (2023). Prevalence of food insecurity and associated factors among households in Waliso town, Oromia, Ethiopia. BMC Nutrition (2023) 9:139. https://doi.org/10.1186/s40795-023-00787-w.

Tefera, B. B., and Birhanu, G. A., (2023). nalyzing actors' interaction behavior in land transactions in informal settlement settings: A case study of Burayu city, Ethiopia . Heliyon 9 (2023) e19515.

Tesfay, B., Solomon, S., Seifu, H., and Katia, S. M. (2014). Urban food insecurity in the context of high food prices: a community based cross sectional study in Addis Ababa, Ethiopia. BMC Public Health .

Teshager, A. (2020). Household level food insecurity assessment: evedence based on panel data, Ethiopia.Elsevier. http://creativecommons.org/licenses/by/4.0/

Todaro, M.P., and Smith, S. (2012). Economic Development. 11th Edition, pearson Education. Boston: Inc., Boston.

UN. (2022). The latest State of Food Security and Nutrition report shows the world is moving backwards in efforts to eliminate hunger and malnutrition. Rome/Newyork.

UN. (2023). End hunger, achieve food security and improved nutrition and promote sustainable agriculture. United Nations in Ethiopia. https://ethiopia.un.org/en/sdgs/2.

WB. (1986). Poverty and Hunger: Issues and Options for Food Security in Developing Countries. Washington DC.

WB. (2022). Urban population - Ethiopia. The World Bank.

WFP. (2022). Ethiopian Country Strategic Plan 2020 - 2025. World Food programme.

World Food Summit. (1996). Rome Declarationon on World Food Security. Rome.

Appendixes

Appendix I Questionnaire for determinants of urban food insecurity

Dear respondent, first of all, thank you for your time that you gave to respond this questionnaire. My name is Bikila Merga, I am MSc student of Addis Ababa University, department of Development Economics. Currently I am conducting survey to access the Determinants of Urban Food Insecurity: In Burayu town of Sheger City Admnistration in Oromia Region of Ethiopia". I would like to ask you some questions which will take a few minutes.

I will not record your name and any information that you provide is confidential. Your participation is voluntary, but I hope you will participate since your views are important.

Part I Household Information			
No	**Questions**	**Category**	**Code**
1	Who is the household head? Is it a man or a woman?	Male	0
		Female	1
2	What is your age?		[ ]
2.1	What is your family size by age group?	0 – 17	[ ]
		18 – 60	[ ]
		Elderly (+ 60 years)	[ ]
		Total	[ ]
3	What is your marital Status?	Single	1
		Married	2
		Divorced	3
		Widowed	4
		Other	5
4	What is your educational level?	Illiterate	1
		Write and read only	2
		Primary education	3
		Secondary school	4
		Diploma	5
		Bachelor's degree and above	6
		Other	7
5	What is your employment status?	Employed in Governmental or NGO	1
		Self employed	2
		Unemployed looking for job	3
		Unemployed not looking for job	4
		Other	5
Part II Household Health			

6	Is the household head is disabled, chronically ill or able bodied?	Disabled	1
		Chronically ill	2
		Able bodied	3
	Do you the member of health insurance?	Yes	1
		No	0
7	What is the type of fuel mostly used by your household for cooking/preparing food? (Circle one)	Electricity	1
		NPG/Natural Gas	2
		Biogas	3
		Kerosene/Paraffin	4
		Charcoal	5
		Firewood	6
		Straw/shrubs/grass	7
		No food is cooked in the hh	8
		Other. Please specify	9

Part III Household Assets, Income, and Expenditure			
8	Total of your family monthly income in birr		[ ]
8.1	How many individuals from the household earn money?		[ ]
8.2	Assets at household home in birr	Car	[ ]
		Motor cycle	[ ]
		Refrigerator	[ ]
		Air Conditioner	[ ]
		Other, Specify	[ ]
9	Do you have your own home?	Yes	1
		No	0
10	Total of expenditure per Month		[ ]
10.1	Average monthly expenditure on food items		[ ]
Part IV Market, Credit, Remittances and Aid			
11	Do you have market access?	Yes	1
		No	0
11.1	If yes to what extent?	Negligible	1
		Very less	2
		Less	3
		Enough	4
		Full	5
12	Do you have credit access?	Yes	1
		No	0
12.1	Who is the main source of credit for all your debts and loans?	Relatives	1
		Traders	2
		Bank/ Credit institution	3
		Other, Specify	4
13	Do you receive a remittance from abroad?	Yes	1
		No	0
	If yes, how much?	Occasionally	1

		Regularly	2
14	Do you have getting any support (cash, food, non-food essential services & goods, etc.) from anyone outside the household at present? If yes then what are those?	Cash for food purchases	1
		Cash for other non- food essential (school, fees, rentals, other bills)	2
		Food (in kind)	3
		Other (specify)	4
	Part V: Household Food Insecurity Access Scale (HFIAS)		
1	During the last 30 days, was there a time when you (or any other adult in the household) were worried you would not have enough food to eat because of a lack of money or other resources?	Yes	1
		No	0
	If yes how often did this happen in the past 30 days?	Rarely (1-2 times)	1
		Sometimes (3-10 times)	2
		Often (more than 10 times)	3
2	Still thinking about the last 30 days, was there a time when you (or any other adult in the household) were unable to eat healthy and nutritious food because of a lack of money or other resources?	Yes	1
		No	0
	If yes how often did this happen in the past 30 days?	Rarely (1-2 times)	1
		Sometimes (3-10 times s)	2
		Often (more than 10 times)	3
3	And was there a time when you (or any other adult in the household) ate only a few kinds of foods because of a lack of money or other resources?	Yes	1
		No	0
		Rarely (1-2 times)	1
	If yes how often did this happen in the past 30 days?	Sometimes (3-10 times s)	2
		Often (more than 10 times)	3
4	A time when you (or any other adult in the household) had to skip a meal because there was not enough money or other resources to get food?	Yes	1
		No	0
	If yes how often did this happen in the past 30 days?	Rarely (1-2 times)	1
		Sometimes (3-10 times s)	2
		Often (more than 10 times)	3
5	The time in the last 30 days, was there a time when you (or any other adult in the household) ate less than you thought you should because of a lack of money or other resources?	Yes	1
		No	0
	If yes how often did this happen in the past 30 days?	Rarely (1-2 times)	1
		Sometimes (3-10 times s)	2
		Often (more than 10 times)	3
6	And was there a time when your household ran out of food because of a lack of money or other resources?	Yes	1
		No	0

	If yes how often did this happen in the past 30 days?	Rarely (1-2 times)	1
		Sometimes (3-10 times s)	2
		Often (more than 10 times)	3
7	Was there a time when you (or any other adult in the household) were hungry but did not eat because there was not enough money or other resources for food?	Yes No	1 0
	If yes how often did this happen in the past 30 days?	Rarely (1-2 times)	1
		Sometimes (3-10 times s)	2
		Often (more than 10 times)	3
8	Finally, was there a time when you (or any other adult in the household) went without eating for a whole day because of a lack of money or other resources?	Yes	1
		No	0
	If yes how often did this happen in the past 30 days?	Rarely (1-2 times)	1
		Sometimes (3-10 times s)	2
		Often (more than 10 times)	3
	Part VI: Coping strategy index		
	In the past 7 days, if there have been times when you did not have enough food or money to buy food, how many days has your household had to:		Frequency score [0 - 7]
1	How many days has had to Rely on less preferred and less expensive foods		
2	How many days had to Borrow food from a friend or relative?		
3	How many days had you purchased food on credit?		
4	How many days had to Send children to eat with neighbors?		
5	How many days had to Send household members to beg?		
6	How many days has your household had to Limit portion size at mealtimes?		
7	How many days had to Restrict consumption by adults for small children to eat?		
8	How many days had to Feed working members of HH at the expense of non-working members?		
9	How many days has your household had to reduce the number of meals eaten in a day?		
10	How many days has your household had to skip entire days without eating?		
	Part VII: Household Dietary Diversity Score		
	Information on household food consumption should be collected using the previous 24hours as a reference period (24-hour recall).	Yes No	1 0
1	Any CEREALS sorghum, maize, rice, wheat, barley? (e.g. bread, injera, porridge, or other grain products)	Yes No	1 0
2	Any PULSES and LEGUMES like beans, peas, lentils, or nuts?	Yes No	1 0
3	Any ROOT and TUBERS like potatoes, enset, yams, cassava	Yes No	1 0
4	Any VEGETABLEs like kale, carrot, sweet potato, tomato, onion, etc.?	Yes No	1 0
5	Any FRUITS like mango, avocado, fruit juice, papaya?	Yes No	1 0
6	Any MEAT beef, lamb, goat, camel, chicken?	Yes	1

		No	0
7	Any EGGS?	Yes	1
		No	0
8	Any FISH?	Yes	1
		No	0
9	Any DAIRY products like yogurt, milk, or other milk products?	Yes	1
		No	0
10	Any foods made with oil, fat, or butter?	Yes	1
		No	0
11	Any sugar or honey or sugary foods such as chocolates, candies, cookies, and cakes?	Yes	1
		No	0
12	Any other foods, such as condiments, coffee, tea?	Yes	1
		No	0

Appendix II Focus Group Discussion with the community check lists

Dear respondents, first of all, I would like to say thank you for your time that you gave to discuss with me. My name is Bikila Merga, I am MSc student of Addis Ababa University, department of Development Economics. Currently I am conducting a research on Determinants of Urban Food Insecurity: In Burayu town of Sheger City Admnistration in Oromia Region of Ethiopia". I would like to discuss with you on food security issue which will take a few minutes. I will not record your name and any information that you provide is confidential.

Food security information
1. Do you think the households of Burayu town have a problem of food security? 2. What it looks like when you think the current food insecurity compared with past? Would you characterize the extent?
Food access
1. Do households have ability to purchase food items or necessities needed? 2. Would you explain food items are accessible, available, and affordable in this town? 3. Would you explain food availability and affordability vary with the season or stable? 4. How do you describe the effect inflation on food prices? Explain 5. Can you list the cultural foods in this area?
Sources of household income
1. What are your sources of the household's income in this area?

2. Which are the major sources of income for this household? Why?
Coping strategies of the households
1. How do people manage if there is food shortage in the households? 2. What are the strategies households practiced to coped-up from the shortage of foods?
Food insecurity determinants
1. Would you mention the determinants of food insecurity?
The challenges to achieve food security
1. Would you try to explain the challenges to achieve food security to the households?

Appendix III Coping strategy Index template

Coping Strategy	**Weighted Score (1-3)**
1. Dietary Change	
• Rely on less preferred, or inexpensive food	1
2. Rotation	
• Limit portion size at mealtimes	2
• Restrict adult consumption	2
• Reduce number of meals eaten in a day	2
• Skip entire day without eating	3
4. Short-term measures to increase household food availability	
• Borrow food or rely on others	2
• Purchase food on credit	2
5. Short-term measures to decrease numbers of people to feed	
• Send family members to eat elsewhere	2
• Send household members to beg	3
6. Others	
• Rely on aid from outside the family	2

Appendix IV Stata outputs

VIF

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Variable	VIF	1/VIF
Incgen	4.73	0.211271
Inc	3.77	0.265112
Fexp	2.83	0.353145
Aid	2.24	0.446987
Dratio	2.04	0.489046
Remit	2.04	0.490659
Educ	1.54	0.647485
Ass	1.50	0.666751
Credit	1.48	0.676625
Employ	1.43	0.701061
Age	1.34	0.748686
Mrkt	1.32	0.756926
Hown	1.23	0.810853
Sex	1.15	0.873303
Mean VIF	2.05	

Logistic Regression

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FS	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Sex	.1567624	.6284528	0.25	0.803	-1.074982	1.388507
Age	-.1242	.0328947	-3.78	0.000	-.1886724	-.0597276
Dratio	.7761493	.373788	2.08	0.038	.0435383	1.50876
Educ	-.687712	.3934991	-1.75	0.081	-1.458956	.0835321
Employ	-1.816871	1.659452	-1.09	0.274	-5.069337	1.435595
Hown	-1.185693	.3602878	-3.29	0.001	-1.891845	-.4795422
Inc	-.0001364	.0000591	-2.31	0.021	-.0002523	-.0000206
Incgen	-.0227385	.2329677	-0.10	0.922	-.4793468	.4338697
Ass	-2.12e-06	7.13e-07	-2.97	0.003	-3.52e-06	-7.23e-07
Fexp	.0001434	.0000867	1.65	0.098	-.0000265	.0003132
Mrkt	.9214688	.7103611	1.30	0.195	-.4708134	2.313751
Credit	.5235371	.8640335	0.61	0.545	-1.169937	2.217012
Remit	-3.291858	1.159965	-2.84	0.005	-5.565348	-1.018369
Aid	-.9635057	1.267133	-0.76	0.447	-3.44704	1.520029
_cons	12.21699	3.251421	3.76	0.000	5.844325	18.58966

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FS	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Sex	1.169718	.7351123	0.25	0.803	.3413038	4.008861
Age	.8832032	.0290527	-3.78	0.000	.8280577	.9420211
Dratio	2.173088	.8122743	2.08	0.038	1.0445	4.521122
Educ	.502725	.1978219	-1.75	0.081	.2324788	1.08712
Employ	.1625335	.2697166	-1.09	0.274	.0062866	4.202145
Hown	.3055342	.1100803	-3.29	0.001	.1507934	.6190667
Inc	.9998636	.0000591	-2.31	0.021	.9997478	.9999794
Incgen	.977518	.2277301	-0.10	0.922	.6191877	1.543218
Ass	.9999979	7.13e-07	-2.97	0.003	.9999965	.9999993
Fexp	1.000143	.0000867	1.65	0.098	.9999735	1.000313
Mrkt	2.512979	1.785122	1.30	0.195	.6244941	10.11228
Credit	1.687988	1.458478	0.61	0.545	.3103864	9.179857
Remit	.0371847	.0431329	-2.84	0.005	.0038282	.3611837
Aid	.3815529	.4834782	-0.76	0.447	.0318397	4.572357
_cons	202196.2	657425	3.76	0.000	345.2694	1.18e+08