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**FOOD SECURITY SITUATION OF URBAN EXPANTION
INDUCED DISPLACED FEMALE HEADED HOUSEHOLDS IN
PERI-URBAN AREAS OF LEGATAFO TOWN, ETHIOPIA**

BY:

NAOMI BERHANU ETANA (GSE/7189/12)

**JUNE, 2023
ADDIS ABABA, ETHIOPIA**



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**A THESIS SUBMITTED TO CENTER FOR FOOD SECURITY
STUDIES OF THE COLLEGE OF DEVELOPMENT STUDIES,
ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF MASTER OF
SCIENCE IN FOOD SECURITY AND DEVELOPMENT**

**JUNE, 2023
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**ADDIS ABABA UNIVERSITY
COLLEGE OF DEVELOPMENTAL STUDIES
CENTER FOR FOOD SECURITY STUDIES**

Declaration:

This thesis is my original work and has not been presented for MSc degree in any other University and that all the source and materials used for the thesis have been properly acknowledged.

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Chairperson of the Center or Graduate Program Coordinator

Dedication

I dedicate this thesis to my loving family who have made my wishes come true and supported my success. My heroic father: Berhanu Etana Bungul, my dearest sister Lensa Berhanu Etana and my amazing nieces Maraki and Hallelujah thank you for your unreserved support and encouragement. It is because of you that I have successfully completed my MSc, Studies

.

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Acronyms and Abbreviation

CBOs:	Community Based Organizations
CSA:	Central Statistics Agency
CSI:	Coping Strategy Index
CS:	Coping Strategies
FANTA:	Food and Nutrition Technical Assistance
FAO:	Food and Agriculture Organization of the United Nations
FCS:	Food Consumption Score
FHHH:	Female Headed Households
FGD:	Focus Groups Discussions
FS:	Food Secure
FIES:	Family Income and Expenditure Survey
FSS:	Forum for Social Studies
HDDS:	Household Dietary Diversity Score
HFIAS:	Household Food Insecurity Access Scale
HH:	Household
KII:	Key Informant Interview
NGOs:	None-Governmental Organizations
PCC:	Pearson correlation coefficient
PIN:	People in Need
UN:	United Nations
USAID:	United States Agency for International Development
UNECA:	United Nations Economic Commission for Africa.
WFS:	World Food Summit

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Abstract

This study is conducted in Oromia Regional State, Finfinne surrounding a special zone of Legatafo town, to examine the impact of urban expansion on induced displaced female-headed households.

A multistage sampling procedure was used to get 162 sample households from Legatafo town of four kebeles. To gather the required information for the study questions, data were collected through both primary and secondary sources and analyzed using both descriptive and inferential statistics. Further, food security indicators such as Food gap months, Household Food Insecurity Access Scale (HFIAS) and Coping Strategy Index were used to measure the continuum of food insecurity experienced by the sample households. The study employ ordered logit regression model used to determine socio-demographic and economic factors that have significant impact on the food security status of the displaced female-headed households. The descriptive result indicated that in the context of Legatafo town, socio-demographic and economic variables such as the age of the head of the household, the educational level of the head of the household, family size, non-agricultural incomes, and large and small livestock ownership don't significantly impact the food security of sample households. On the other hand, agricultural land size, annual crop production, food aid, remittances, and the sickness of the head of the household have a significant impact on the food security situation of the household. The results of the ordered logistic regression model showed that out of the thirteen explanatory variables feed into the model; six variables were identified as having a significant impact on the food security of the target female-headed households. Annual crop production, ownership of large livestock, and agricultural land size were found to be positively correlated with the displaced female-headed household's food security.

Keywords: *Female-headed, Food security, Peri-urban, Urban expansion, HFIAS and CIS*

CHAPETER ONE: INTRODUCTION

1.1 Background of the study

Urban expansion relates to the growth in the proportion of a population living in urban areas and the further physical expansion of already existing urban centers (Kasa *et al.*, 2012). The rapid growth of the urban population is a contemporary global phenomenon. UN Habitat 2020 estimated that in 2036, 62% (5.4 billion) of the global population is expected to reside in urban areas.

The world is experiencing different patterns in the urban and rural population growth. According to the World Urban Expansion Prospects (2018), by 2050, with 5.6 billion urban dwellers, the less developed regions are projected to have 83% of the world's urban population. Correspondingly, with 1.1 billion urban inhabitants, the urban areas of the more developed regions will account for only 17 per cent of the urban population of the world.

The World Urban Expansion Prospects (2018) categorized factors that contribute to urban population growth into three: Natural increase in urban populations results from an excess of births over deaths in urban areas. Migration to cities from rural areas or from abroad contributes to urban growth whenever the number of in-migrants exceeds the number of out-migrants and Reclassification contributes to urban growth by enlarging the size of urban areas.

As the urban population increases, so does the need for urban infrastructure and services, which leads to the expansion of cities to the surrounding periphery areas. Horizontal urban expansions do have both positive and negative impacts on local community. According to Mideksa, (2017), the positive aspect of urban expansion includes aspects like it creates opportunities in wage employment, opportunities for household engagement in non-farm activities and provides them with access to services and infrastructure. Abdalla *et al.* (2013), stated that urbanization related problems ranges from urban poverty, malfunction agriculture, the socioeconomic and ecological problems generated by urbanization to adaptation and resistance of agriculture at peri-urban areas.

Dires *et al.* (2021), articulate that in developing countries urbanization's growing demand for urban land is largely met by transforming rural land on the outskirts of existing built-up areas. This engulfment of rural farmlands through urban expansion forced farming communities to lose their croplands. "Urban expansion will result in a 1.8–2.4% loss of global croplands by 2030 and about 80% of global cropland loss from urban expansion will take place in Asia and Africa" (Bren *et al.*, 2016). In this scenario, farmers in the periphery are displaced and further obligated to involve in other types of occupation, mostly into less productive ones. "Between 1988 and 2008, a minimum of 300 million people around the world lost their land because of expropriation. Many people around the world are losing their homes, livelihoods, health and even their lives because of expropriation" (Dires *et al.*, 2021).

Nowadays, Africa's urban population is growing at an accelerating rate and the UN-Habitat report of Housing (2021), stated that between 2000 and 2030, Africa's urban population will increase from 294 million to 742 million" as a result, Africa will lose large hectares of croplands and crop production which in turn risk the food and livelihood security of evicted farmers. 96% of urban growth will occur in the less developed regions of East and South Asia and according to Breb *et al.* (2016), due to urbanization, 84% of global productions losses are expected to occur in Africa and Asia" (Bren *et al.*, 2016).

According to World Bank Ethiopia Overview Paper #1, with more than 112 million people in 2019, Ethiopia is the second most populous nation in Africa after Nigeria and one of the lowest urbanized countries in the continent. However, these days the country is experiencing rapid rate of urbanization. (Tassie, 2018) states that the share of the population living in cities has increased from an estimated 7.1% in 1994 to 16% in 2008 and is expected to reach 60% by 2040 at the current annual growth rate of 3.5%.

Both rural-urban migration and the horizontal expansion of cities are playing significant roles in the rapid urbanization of the Ethiopia. The latter one causes loss of agricultural land, which forces peri-urban farmers to become part of the urban system and also to be more food insecure as they lose their main sources of livelihood. According to Engdaw and Kebede (2018), urban expansion to peri-urban agriculture, which often plays a significant role in supplying foodstuffs

to cities, and weak tenure system of agricultural productive lands may shift to less productive areas, which could, *ceteris paribus*, result in yield losses.

From personal observation, the study area, Legatafo town, which is found in the Oromia region, north-east of Addis Ababa at a distance of 21 km, is among the peripheries where the process of urban expansion increasing rapidly. According to the Legatafo town administration, in the past 10 years (2010–2020), due to the establishment of large projects such as food processing and textile industries, real estates and residential construction about 880 households (230 women and 650 men households) lost their agricultural lands.

In connection to this, peri-urban female-headed households displaced due to urban expansion are the focus of this study since, to the best of the researcher's knowledge, very few studies exist that have dealt with the impacts of urban expansion on displaced peri-urban female-headed households' food security situation in Ethiopia. Studies such as (Felker-Kantor and H.wood, 2019) and Tassie (2018) confirmed that in rural context, female-headed households experience food insecurity more than male headed households.

Against this background, the researcher believes that the adverse effect of urban expansion on the food security situation of peri-urban female-headed households deserves additional study. Therefore, the findings of this study will fill information and knowledge gaps in this thematic area.

1.2 Statement of problem

As the demand for land in Addis Ababa increases, the city is physically expanding to the neighboring peri-urban areas by including additional land from its surrounding. This horizontal urban expansion has both positive and negative impacts that are serious and multidimensional. It affects the social, cultural, economic and physical arenas of the framing community in the periphery and indigenous farmers in the study areas are experiencing this.

“Urbanization generates both challenges and opportunities for agriculture at the peri-urban area. Opportunities include proximity to urban markets, access to labor, greater

off-farm employment opportunities, new markets for higher value and income from recreational activities, while challenges cover issues like scarcity of productive land, conversion into non-farm activities, increased land value which create high competition over land use, landscape fragmentation, neighbor conflicts and environmental pollution (Abdalla et al., 2013:8).

Further, Prasad (2016) emphasized that urban sprawl/peri-urbanization has its own pros and cons with positive and negative consequences and impacts; but, the negative impacts are often more highlighted as this is an uncontrolled or uncoordinated growth and eventually the negative impacts obliterate the positive sides. On the other side, there are some positive impacts of urban sprawl, like increase in economic production, increase in opportunities for employment, better opportunities and better services creating better living conditions, better lifestyles.

Both scenarios (the positive and negative impacts) were the observable facts in the study area. As per the Legatafo town administration, due to unplanned human settlements, industrial establishments, real estate investments and residential construction a total of 880 farming households (230 women and 650 men households) were displaced from their lands from 2010 to 2020. Tassie (2018) states such situation will exacerbate further expropriation of farm households and may lead to food insecurity and social instability. Due to the experience of their background, evicted farmers mostly don't have technical skills (business knowledge and entrepreneurial skills) to fit into the urban settings which further aggravate the severity of horizontal urban expansion effects on the farming community. In times of crisis, women, children, and the elderly are affected disproportionately. According to Lain and Fuller 2017, female-headed households become more vulnerable than male-headed households to climate-related crises and other shocks.

With this justification, in Ethiopia, the details of the adverse effect of horizontal urban expansion on female-headed household's food security situation have not been critically studied, though women farmers play a significant role in food production and food security at both the household and national levels. "Women account for 70 to 80% of household food production in Sub-Saharan Africa" (Brown et al., 2020).

Therefore, this research was conducted in Legatafo town to address this gap, as farmlands in the study area are highly converted to other forms of land use especially without taking into consideration female-headed farm household needs and priorities. Thus, this research deeply investigates the challenges imposed by urban expansion on the food security situation of induced displaced peri-urban female-headed farmers focusing on questions related to how they are addressing their food security, how do they integrate into the new skill market, and adapt to urban life and how they are diversifying their livelihood sources.

1.3 Objective of the study

1.3.1 General objective

The aim of the study is to investigate the impact of urban expansion on displaced female-headed farming household's food security situation in Oromia Regional State, Finfinne surrounding the special zone of Legatafo town.

1.3.2 Specific objectives

More specifically, the research planned to:

- Assess the food security situation of peri-urban female-headed households in the study area.
- Analyze determinates of food security status of displaced peri-urban female-headed households in the study area.
- Identify the coping mechanisms of peri-urban female-headed households displaced due urban expansion in the study area

1.4 Research questions

This research was intended to answer the below five questions that are derived from the above-research objectives:

1. What are the major sources and types of foods of peri-urban female-headed households displaced due to urban expansion?
2. How do peri-urban displaced female-headed households access food in the new settings?
3. Is there any change in the feeding pattern and frequency of peri-urban female-headed households displaced due to urban expansion?
4. What are the coping mechanisms adopted by the displaced female-headed households to align with the peri-urban way of life?
5. What should be done to reduce the negative impacts of horizontal urban expansion on the food security of displaced female-headed households.

1.5 Significance of the study

Horizontal urban expansion is among the development challenges that Ethiopia is still struggling to address. Stakeholders, including the government, non-governmental organizations (NGOs), private sectors, and informal community institutions, are working to fill the gaps created by urban expansion in the food and livelihood security of the displaced peri-urban communities. Despite the efforts made so far, the problems are deep, and when it comes to female-headed farm households, they deepen even more.

Legatafo town is one of the special zones of Finfinne Surrounding and, it is an area impacted by the horizontal expansion of Addis Ababa. To date, there have not been studies conducted to show the effect of urban expansion on the food security situation of peri-urban female-headed farm households. Hence, this study will fill the literature gap by identifying the negative impacts of horizontal urban expansion on the food security situation of female-headed farm households. Furthermore, it will provide markable information as well as indicate the implications of urban expansion on female-headed households. Last but not least, the research findings can also provide important recommendations and directions to policymakers and development actors to

take the necessary measures to reduce the adverse effects of urban expansion on female-headed farm households and to sustain their food security situation.

1.6 Scope of the study

This research is within the scope of the assessment of the impacts of horizontal urban expansion on the food security situation of displaced female-headed farm households in the case of four peri-urban kebeles (01, 02, Dambel, and Eka) of the Lega Tafo town special zone of the Oromia Region, where the horizontal expansion of Addis Ababa is significantly observed.

The timetable required to carry out and finalize this research is 9 months (from proposal preparation to submission of the approved thesis). To see the dynamics of urban expansion on the food security of displaced female headed households, the research collected and analyzed data related to socio-economic and demographic characteristics (age, sex, education level, household size, landholding size, income, housing condition, employment, occupation, etc.) of target groups.

1.7 Limitation of the study

In connection to its objectives, this study only focuses on female-headed farm households whose farmland was taken due to urban expansion, who were displaced, and as a result, whose means of food security have changed. Thus, the targeted sample groups in this study do not represent peri-urban female-headed households whose sources of food security don't come directly from farming (own crop production or animals rearing).

Further, there are very few works of literature that specifically deal with the food security situation of peri-urban female-headed farmers in the context of horizontal urbanization, particularly in Ethiopia's case, and this, coupled with a lack of structured and up-to-date data at the Legatafo town municipality, might slightly affect some of the findings of the study. Moreover, the time and budget allocated to carry out this research might not be adequate enough for the researcher to conduct extensive investigations since the researcher is expected to search for and locate the displaced female headed farmers to the level of the required study sample size.

1.8 Organizations of the thesis

This study has five chapters. Chapter one introduces the background, the statement of the problem, objectives of the study, research questions, significance, scope and limitation of the study. Chapter two presents review of related literatures that are related to the subject matter of the study. The third chapter deals about description of study area, research design, study population, data type, sources and tools of data collection, ethical considerations, sampling techniques and sample sized determination, and methods of data analysis. Chapter four presents the results and discussions of the study. The last chapter forwards the study's conclusions and recommendations.

CHAPTER TWO: RELATED LITERATURE REVIEW

2.1 Concepts of urban expansion and theoretical foundation

2.1.1 Empirical evidences

2.1.1.1 Trends and causes of urban expansion

Kasa *et. al* (2012), state that urban expansion refers to a growth in the proportion of a population living in urban areas and the further physical expansions of already existing urban centers. Throughout human history, the world's population has been gradually growing and urban expansion become a global phenomenon, "between 2007 and 2050, the world population is projected to increase from 6.7 to 9.2 billion, and most of this growth will occur in urban areas of less developed countries" (Matuschke, 2009).

The world is experiencing the process of urban expansion in different patterns. Along with Asia, Africa is now becoming the epicenter for urbanization. According to UNECA (2017), in 1990 only a third of Africa's population was urban (31%)—by 2035, the figure is projected to reach 49%. Figuratively, UN-Habitat report of Housing, the Poor in Africa Cities (2021), stated that, between 2000 and 2030, Africa's urban population will increase from 294 million to 742 million. Like in any other developing country, the demand for urban land in Africa is also taking place mainly by converting peri-urban agricultural land into other forms of land use. As stated by Toulmin (2009), rapid urban growth in Africa is also having a major impact on peri-urban land values, with rising insecurity for those living and working on such land.

Recent evidences confirmed that Ethiopia is one of the least urbanized countries in the world today, and this is common with many other developing countries. Nowadays, this pattern is changing. "Ethiopia's urban growth rate is more than 4.0% per year, which places it among the highest in Africa and the world" (Kumie *et al.*, 2016). As a result, there is a rapid increase in urban population of the country.

Ayele and Tarekegn (2020), asserted this idea as in Ethiopia, the population living in cities is expected to grow from 15.2 million in 2012 to 42.3 million by 2034, corresponding to an annual growth of 5.4%. The share of the population living in cities has increased from an estimated 7.1% in 1994 to 16% in 2008 and is expected to reach 60% by 2040 at the current annual growth rate of 3.5 %. Literatures discussed that urban expansion in the developing countries majorly driven from two factors: the natural increase of population which occurs when the number of births exceeds the number of deaths and the other is rural-urban migration.

The first source of urban expansion to the periphery is engendered by the “economic development projects” or “urban clearance” or “industrialization”. The second reason for urban expansion to the periphery is mainly due to natural population growth, but rural–urban migration contributes even more in many developing countries (Teller and Hailemariam, 2011). According to N.H. Koroso *et al*, (2021) migration is the major factor behind Addis Ababa’s population change.

As the residents of cities increases, demand for development infrastructure and services rises simultaneously. Hence, “urban centers have been physically expanding their boundaries into surrounding rural and peri-urban areas by including additional land where people had previously based their lives in agriculture” (Ayele1 and Tarekegn, 2020).

This is also asserted by Talema and Nigusie (2023) that uncontrolled urbanization, which most often results in horizontal urban expansion, has a negative impact on the natural environment and the livelihoods of the agricultural community. They also stated that unplanned horizontal urban expansion results in farm size reduction, eviction of farming households from their main source of income generation and creates burden on the local environment as well as on the economy.

Alamneh et al. (2023), further elaborated urban expansion is most likely associated with land use change of the peri-urban agricultural land that eventually forces people to displace from their original environments is often a life changing event.

Urbanization in Ethiopia is not supportive of farmers who are forced to leave their land and property in periphery and thus has a negative impact on people livelihood where women and youth are the major victims, for instance the consumption expenditure of evicted households was decreased by 5936.92 Ethiopian Birr compared to non-evicted households (Alamneh *et al.*, 2022).

2.1.2 Theoretical foundation

There are various theoretical explanations that discussed the cause and consequences of horizontal urban expansion on the peri-urban agrarian communities. This research befitted from the three urban expansion theories, Population growth theory, economic growth theory and sprawl concepts and theories. Tigabu (2018) elaborated the first two theories that population growth theory argued that an increment in urban population either in natural growth or in rural to urban migration explodes to the surrounding of city. The economic growth theory focuses on the expansion of economic base such as per capita income and employment rate increases demand of new housing places and related infrastructures. In addition, the establishments of new industries at urban periphery forced farmers from their land possession.

The third theory which is urban sprawl concepts and theories serve as the foundation for this research. According to Mukherjee (2016), urban sprawl is also known as ‘horizontal spreading’ or ‘dispersed urbanization’. The uncontrolled and disproportionate expansion of an urban area into the surrounding countryside, forming low-density, poorly planned patterns of development is described as urban sprawl. In accordance with Siedentop and Fina (2005), there are two types of explanation patterns for causes of urban sprawl: the first sprawl is related with the rising incomes of people allow residents to purchase larger living space. These residents locate where housing options are less expensive, in suburban and ex-urban areas generally located at the outskirts of metropolitan areas.

The second one is explained by the demand for urban land. Driving forces are land consumption of households, companies, and public uses. Karakayaci (2016), asserted this urban growth which develops according to demands of dwelling, industry and business sectors is in the trend of expanding towards city boundaries and causes occupation of agricultural lands and forests in the

peri-urban areas. Thus, the urban sprawl concept and theory establishes connection between urban expansion and the livelihoods and food security of peri-urban communities. According to Tjahja *et al*, (2018), urban sprawl is a catalyst for the gradual integration of the sociocultural of rural communities, from traditional rural communities to modern society. This concept linked with the ideas that urban expansion affects sociocultural livelihoods and food security in the peri-urban areas as it causes loss of agricultural lands which is the base for the lives and livelihoods of peri-urban societies.

Role of urban and peri-urban agriculture- as a major source of produce, means of improving food security and enhancing the livelihoods of poor producers- is becoming increasingly important. Pressures on peri-urban and rural water and agricultural systems are becoming increasingly complex with multiple stresses and impacts. (Gupta et al., 2021)

By the same token, the expansion of Addis Ababa is impacting the social, cultural, economic, political and physical arenas of the farming community living in the surrounding of the city.

2.1.3 Concept of food security

According to FAO's factsheet (2006), the concepts of food security first originated in the mid-1970s, when the World Food Conference (1974), defined food security in terms of food supply. "Availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices". In 1983, FAO analysis focused on food access, leading to a definition based on the balance between the demand and supply side of the food security. "Ensuring that all people at all times have both physical and economic access to the basic food that they need".

The shortcomings of the early understanding of food security causes for the development of new insights that shift the understanding of food security from global and national level to household level. In 1986, the definition was revised to include the individual and household level, in addition to the regional and national level of aggregation, in food security analysis. The widely accepted World Food Summit (WFS) November, 1996 food security definition reinforces the

multidimensional nature of food security and includes food access, availability, food use and stability.

“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”.

The 1996 definition of food security points out the following four key dimensions:

Food availability: The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid).

Food access: Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources).

Utilization: Utilization of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security.

Stability: To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security.

2.1.4 Causes of food insecurity and food security indicators

According to Maxwell and Frankenberger (1992 cited in Zebu, 2014) risks to food security could originate from natural causes (such as drought, human and animal epidemic, flood, earthquake), institutions and policy failure (tax, removal of subsidy, property right), market failure, lack of employment opportunities and change and failure in community obligations. On the other hand, in the peri urban settings loss of livelihoods asset such as agricultural farmlands for the purpose of house construction and industrial development in the process of urban expansion is a cause of food insecurity.

Measuring food security is a complex task that needs effective planning and analysis in order to avoid misleading outcomes and conclusions. There are various types of food security indicators used by development practitioners, academicians, and policy makers. However, the most widely used household level indicators for food security are:

Household food supply: related with months of adequate food provision. It captures changes in the household's ability to address vulnerability to ensure that food is available year round (Vhurumuku, 2014).

Experience-based Food Insecurity Scales: used commonly the Coping Strategies Index (CSI)/Reduced Coping Strategies Index, Household Food Insecurity Access Scale (HFIAS), Household Hunger Scale (HHS) and Food Insecurity Experience Scale (FIES). All these tools used to measure level of household food insecurity (Vhurumuku, 2014).

Household Expenditure: information is used as a proxy of purchasing power. Understanding household expenditures provides an insight into how households allocate scarce resources and give priority to competing needs (Vhurumuku, 2014).

Dietary Diversity: the two indicators are Household Dietary Diversity Score (HDDS) and Food Consumption Score (FCS). These tools provide an indication of household level access to food of sufficient quality and quantity (Vhurumuku, 2014).

Through the application of the above tools and indicators, in general to categorize a household as food secure or not, the food security analysts have classified households into four general types and these are:

Food secure: households that show no or minimal evidence of food insecurity.

Food insecure without hunger: food insecurity is evident in household members' concerns about adequacy of the household food supply and in adjustments to household food management, including reduced quality of food and increased unusual coping patterns. Little or no reduction in members' food intake reported.

Food insecure with hunger (moderate): food intake for adults in the household reduced to an extent that implies, adults have repeatedly experienced the physical sensation of hunger.

Food insecure with hunger (severe): at this level, all households with children have reduced the children's food intake to an extent indicating that the children have experienced hunger. For some other households with children, this already has occurred at an earlier stage of severity. Adults in household with and without children have repeatedly experienced a more extensive reduction of foodstuff intake.

2.1.5 Determinates of households food security

Currently, there is enough food to feed everyone on the planet, but many people continue starving. As per UN News global perspective Human Stories 2019, enough food is produced today to feed everyone on the planet, but hunger is on the rise in some parts of the world, and some 821 million people are considered to be “chronically undernourished.

Though there is sufficient food in the world, due to poor access and a lack of fair distribution of food, household food insecurity remains a development challenge, majorly in the developing countries. According to Aragie and Genanu (2017), the problem of household food insecurity is primarily a distributional issue a matter of getting available food to people who need it, when they need it, and ensuring their regular, appropriate, and affordable access to food.

Furthermore, Aragie and Genanu (2017), elaborated that determinates of household food security vary from context to context (rural, urban, regional, national, and local). Among the many variables, the following: income of a household, number of income sources, age of household head, household size, educational level of household members, ownership of productive assets, and size of farmland majorly determine a household's food security situation.

2.1.6 Household coping mechanisms

Ethiopia's history shows that the country has experienced severe recurring food shortages and famine for long periods of time due to both natural and man-made disasters. According to Endalew *et al.* (2015), food insecurity emerged as a key problem and a development challenge in the early 1970s and has become persistent in the subsequent decades. Abi (2011), asserted that, in Ethiopia's context, among the several factors, adverse climate changes combined with high population pressure, urban expansions, environmental degradation, technological and institutional factors have led to a decline in the size of per capita landholding, which causes a serious growing food security problem in Ethiopia.

When households experience food shortage, they use various mechanisms to cope up with the adverse effect of the situation. As stated in Maxwell (1996) cited in Abi (2011), household responses to food insecurity classified into two: coping strategies and adaptive strategies. Coping strategies are responses made by households to improve the declining situation of households food security while adaptive strategies involve, a permanent change in the mix of ways in which food is required, irrespective of the year in question and it refer to long-term adjustment. According to Maxwell *et al.* (2003), the most commonly practices of coping strategies by food insecurity household in time of crisis categorized into four First, households may change their diet (switching from preferred foods to cheaper, less preferred substitutes). Second, to the household can attempt to increase their food supplies using short-term strategies that are not sustainable over a long period (borrowing, or purchasing on credit; more extreme examples are begging or consuming wild foods, or even seed stocks). Third, households can try to reduce the number of people that they have to feed by sending some of them elsewhere (anything from simply sending the kids to the neighbor's house when they are eating, to more complex medium-term migration strategies). Fourth, and most common, households can attempt to manage the shortfall by rationing the food available to the household (cutting portion size or the number of meals, favoring certain household members over other members, skipping whole days without eating, etc.)

2.1.7 Food security situation in Ethiopia

Food is human right, according to General Comment 12 (Committee on Economic, Social and Cultural Rights, CESCR, 1999)

The right to adequate food is realized when every man, woman and child, alone or in community with others, has physical and economic access at all times to adequate food or means for its procurement (UN Human Right, 1999).

The historical background of the food security situation in Ethiopia is highly interconnected with severe food shortages and famine. As the country's agriculture system is rain-fed. Failure of adequate rains in cropping seasons leads to serious food shortages. Abdullah (2017), highlighted that Ethiopia's production failures began in the 1984/85 and the drought that has occurred in this year was the most serious one by affecting over eight million people and causing the death of one million.

Further, he underpinned the food insecurity situation that has happened in 1999-2000 was the cause for the death of 100,000 people in the pastoral areas of the country. Since then Ethiopia continues experiencing various food security crisis in the year 2003, 2008, 2011, 2013, including the 2015 El Niño drought.

This climate related shock that is going together with natural resource degradation, population pressure, land fragmentation, limited job opportunity outside agriculture; have undermined the ability of millions of rural and peri-urban households to survive risks, attain food security and escape poverty and this shows there is a direct link between natural resources degradation, population pressure, climate change, food security and poverty

2.1.8 Impact of urban expansion on peri-urban food security

The horizontal expansion of cities around the world is taking place by transforming peripheral agricultural lands into other forms of land use. Bren d'amour *et al.* (2016), confirmed that more than 60% of the world's irrigated croplands are located near urban areas, highlighting the potential competition for land between agricultural and urban uses. This phenomenon puts a

strain on developing countries' food production system and jeopardizes livelihoods in areas where agriculture is the primary source of food. According to Lasis *et al.* (2017), approximately 14 million hectares of land (approx. 475,000 ha/yr.) in developing countries would be converted into various land uses and between 1990 and 2020 approximately 400,000 hectares of vegetative land cover has been lost. Agriculture is still the most important sector in Ethiopia. It is mainly dominated by smallholder farmers and it is the main source of food security, income, and employment. According to Beyene (2019), the agricultural sector's contribution to Ethiopia's GDP is 35% while the services and industry sector contribute 39% and 27% respectively. The declining of the contribution of the agriculture sector does not mean that the overall agricultural production decreased, but its contribution to the country's overall GDP went down relative to other areas.

Despite this fact, “more than 70 million people (85% of the Ethiopian population) depend on agriculture directly or indirectly for their livelihoods (Kumie *et al.*, 2016). Thus, any effect on agriculture will significantly affect the food and livelihood security of the majority. Ayelel and Tarekegn (2020) stated that the land tilled by Ethiopian small-scale farmers accounts for 95% of the total area under agricultural use, and these farmers are responsible for more than 90% of the total agricultural output

In relation to the above facts, smallholder farmers at the periphery of Addis Ababa, whose sources of livelihood and food are exclusively agriculture, potentially become vulnerable to the negative impact of horizontal urban expansion. According to Ayelel and Tarekegn (2020), a study conducted on the major drivers of urban sprawl and their impacts on land use conversion in the peri-urban kebeles of Dukemtown, central Ethiopia, showed the total cultivated land available to grow wheat had declined from 230.82 km² in 2005 to 104.82 km² (55%) in 2011, whereas teff flour crop production shrank from 134.77 km² to 93.67 km² (30.4%) over the same period. The overall yield harvested for both crop types decreased drastically between the 2005 and 2011 harvesting seasons. For example, the combined yield (teff and wheat) was reduced from 1280.3 tons in 2005 to 867.7 tons in 2011. In general terms, it can be said that the higher rate of horizontal urban expansion leads to a higher loss of agricultural land which in turn causes livelihood and food insecurity in the peri-urban areas.

2.1.9 Role of women in food security

Women play significant role in bringing food to the household table. According to the USAID factsheet, "in most developing countries, women produce between 60 and 80% of the food". (Sulaimon, 2018) stated that in Africa, 63% of female in compare to 48% of male workers depended on agricultural-based livelihood. Despite their contribution to the household and national food security, they are always behind their male counterparts in terms of ensuring their income and food security due to gendered constraints such as lack of agricultural land ownership, less access to credit, agricultural technology, and education. These gender disparities result in fewer foods produced, less income earned, and higher levels of poverty and food insecurity. According to FAO's factsheet (2013), differences in risk and vulnerability between men and women can affect the stability of their food security in different ways. In times of crisis such as crop failure, natural and human made disasters, women and girls are often forced to reduce their food and nutrition intake to feed other household members especially children.

The expansion of cities towards the nearby peri-urban areas exacerbates the landlessness and disruption of livelihoods and food security among the peri-urban community, majorly for women farmers. Abu *et al.* (2021), emphasized that the conversion of peri-urban agricultural lands into permanent uses, such as residential, commercial, and industrial uses, tends to undermine agricultural-based livelihoods and disempower the people, especially women

2.2 Conceptual framework

Nowadays, urban sprawl is happening at an alarming rate, especially in developing countries. In this process of urban sprawl, horizontal expansion has become a hot agenda in most developing countries. Though urban expansion has its own positive impacts, such as creating local economies and improving access to infrastructure and services, in the study area the negative impacts outweigh on peri-urban farming communities, the urban expansions are uncontrolled and less coordinated. The negative impacts observed in the study areas include loss of crop production, loss of livestock, loss of on-farm income, unemployment, and displacement, loss of social capital and loss of social network which positioned the poor agrarian households to be food insecure.

The framework is consisting of major factors that determine the household food security situation in the peri-urban contexts; it includes socio-economic factor (crop production, livestock ownership, on-farm incomes, new life skills, unemployment and displacement).

According to Abdullah *et al.* (2017), the age of HHH is significantly positively correlated with the food security of HHH. Unlikely, in this study, the change in the age of the head of the household, the educational level of the head of the household, family size, agricultural, and non-agricultural incomes, and large and small livestock ownership don't have a significant impact on the food security status of the displaced female-headed household in Legatafo town. This result shows that irrespective of the important socio-economic factors, the sampled households become food insecure. According to Ayele 1 and Tarekegn (2020), the process of peri-urbanization has led to a complete transformation of the way of life in indigenous farming communities, resulting in all displaced families being resettled in the same community section.

Getaneh *et al.* (2022) discovered that agricultural land size and annual crop production have a positive and significant relationship in improving the food security situation of peri-urban households. Likewise, the study found that agricultural land area, annual crop production, food aid, remittances, and household member health were all positively and significantly associated with household food security status.

The conceptual framework of this study, as shown in Figure 1, included demographic and socio-economic factors that might have an effect on and be affected by the peri-urbanization process, which can translate into the disruption of the food and livelihood security of the farming community in peri-urban areas.

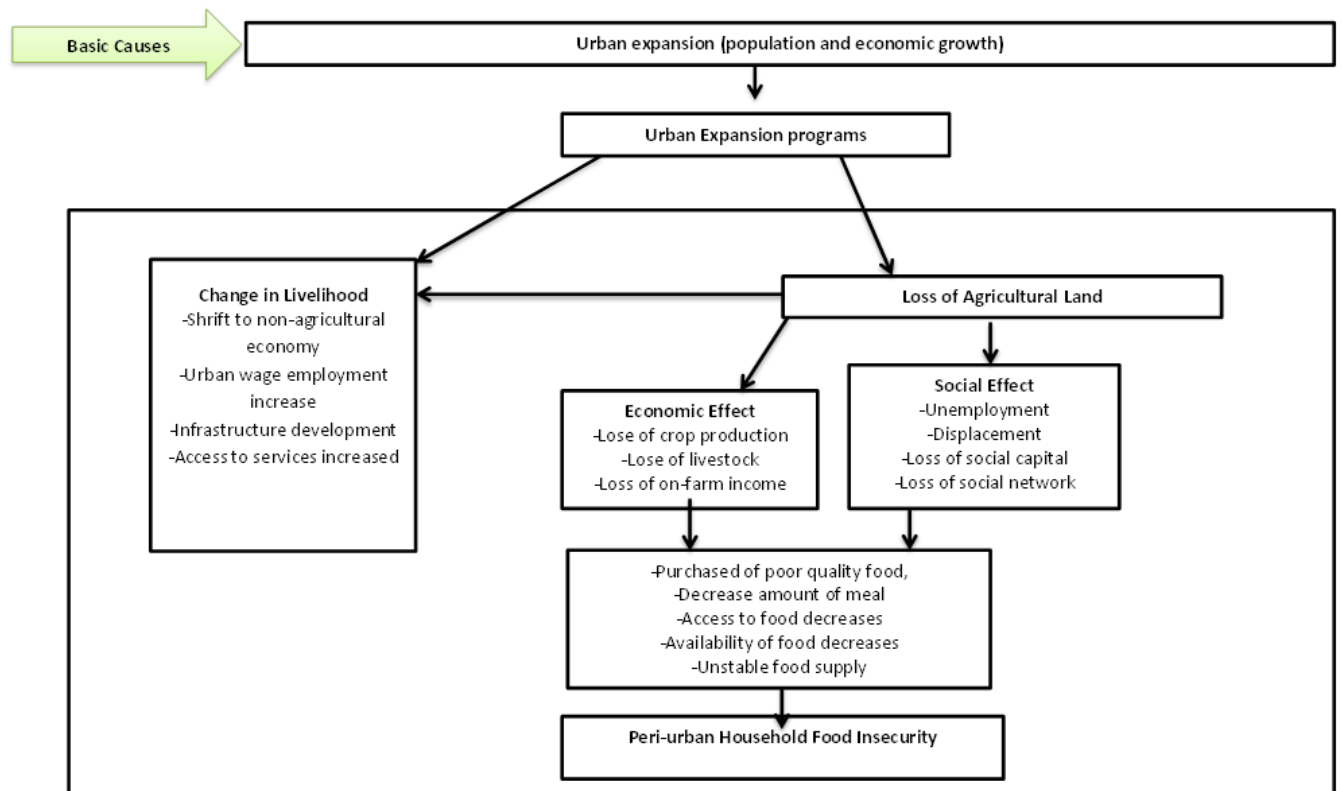


Figure 1: Conceptual framework for effects of urban expansion

(Sources: adopted from “Rapid urban expansion and food security using food density maps to identify future food security” Matuschke (2009).

CHAPTER THREE: RESEARCH METOD

3.1 Description of study area

This study was conducted within the scope of the assessment of the impacts of horizontal urban expansion on the food security situation of female-headed households in the case of four peri-urban kebeles in the Legatafo town special zone of the Oromia Region, where the horizontal expansion of Addis Ababa is significantly observed.

Geographically, Legatafo town is located in Oromia National Regional State, at a distance of 21 km, from Addis Ababa, the capital city of Ethiopia. Its astronomical location is between 9°01'29" N - 9°06'0'' North Latitude and between 38°53'42" E - 38°55'30" East Longitude.

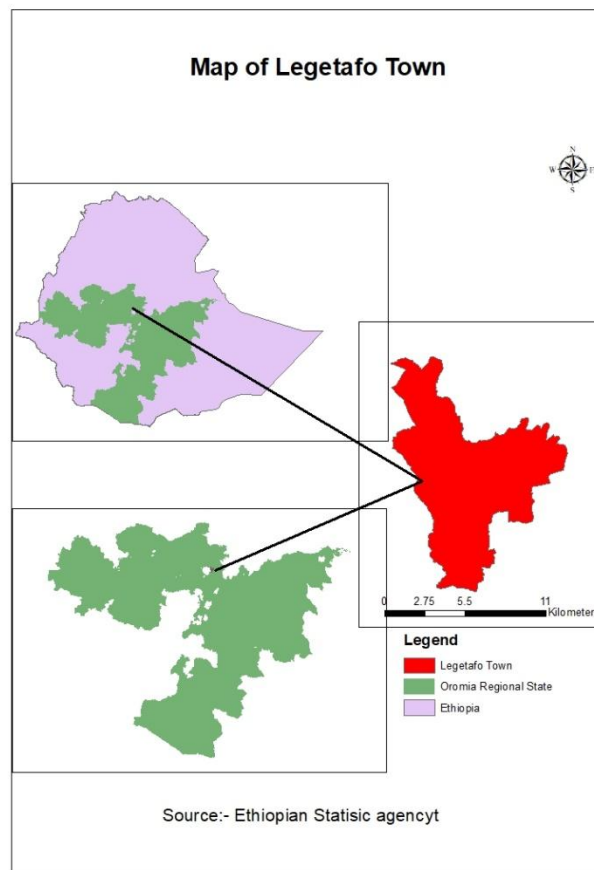


Figure 2:Map of Legatafo town

Legatafo town is bordered by Addis Ababa city and Sululta Wereda from the west and Northwest, by Berek Aleltu Wereda from the North, East and South. Recently the town administration has four kebeles namely, LagaTafo (01) and LagaDadi (02), Dambel and Eka. Legatafo is found at an average elevation of 2350 meters above sea level; the mean annual maximum and minimum temperatures of the town are 23.76°C and 10.67°C, respectively with the Mean Annual Rainfall of 1,223.54 mms . The total population of the town was estimated in 2016 to be 18,177 out of which 9157 were males, and 9020 were females. However, the actual size of the population of the town soared in the last couple of years due to migration and increasing investment interests due to which the population is estimated to exceed thirty thousand. (Udessa et al., 2021)

3.2 Research design

This study employed a cross-sectional survey design in response to the research questions and objectives of the study. The researcher used this study design to investigate the current food security status of female-headed farming households displaced from their farmland by the horizontal expansion of Addis Ababa to Legatafo town.

Based on the objectives and questions of the study, both quantitative and qualitative data were collected that enabled the researcher to get the intended and credible information and to generate acceptable evidence.

3.3 Study population

The target population for this study was female-headed farm households who were affected by the horizontal expansion of Addis Ababa from 2010 to 2020 and who still are living in the Legatafo town.

3.4 Research approach

3.4.1 Data type, sources and tools of data collection

The literature review conducted revealed that horizontal urban expansion causes the loss of crucial livelihood assets such as economic (income), natural (farmlands), social and physical losses (farm tools, shelters) which in turn have negative consequences on the food security situation of the farming community in the peri-urban.

With this rationale, to understand the multidimensional effects of urban expansion on female-headed farming households, the research assessed the types of assets lost, change in income, change in savings, change in occupation, change in food intake type and frequency, perception of female-headed households on welfare, and various actors' interventions to sustain the livelihood and food security of women farmers.

To gather the required data, the researcher utilized both primary and secondary data sources. To collect the information tools such as guidelines and checklist were applied to guide the household survey.

3.4.1.1 Household survey

The researcher developed the survey questionnaire based on previous knowledge and literature review. The survey was used to collect data on (a) demographic characteristics of the target population; (b) livelihoods and income (crop and livestock production) (c) livelihoods and income from non-farming activities (d) household access to food and food supply adequacy and (e) coping strategies to understand the food security situation of the targeted households. To collect the survey data the researcher deployed 10 data collectors who have been taken through all the survey questions and pre-tested them before the actual collection of the survey data.

3.4.1.2 Key Informant Interview (KII)

7 KII was administered at Legatafo town levels. In the KII guiding questions used and relevant individuals participated in the KII who represent the City Administration, Women, Children and Youth Affairs, Agriculture and Natural Development, Labour and Social Affairs, office of Land Administration, Office of Job Creation and Development and Community Based Organizations (CBOs). The in-depth interview was conducted face-to-face in order to facilitate open discussion and gather more detail information. Purposive sampling technique was applied to identify individuals involved as key informants.

3.4.1.3 Focused Group Discussion (FGD)

This research has conducted FGDs with selected female-headed households. The information gathered enriched the results from KIIs and surveys. in total 4 FGDs/1 per research Kebele were conducted. The FGDs were conducted with female-headed farmer households in small groups of 8-12 persons per each FGD. The purpose of the FGD was to gather information related to challenges faced by the women, types and sources of income, coping strategies employed during shortage of food, consumption pattern and employment opportunities, expenditure pattern and assistance they are receiving from state and non-state actors to sustain their livelihood and food security.

3.4.1.4 Observation

The study team undertook observations on the study sites. This tool has helped to have a first-hand insight into the conditions such as means of livelihoods, existing institutions, and demography composition of the study kebeles. The observation information used to complement collected data from other sources.

3.4.1.5 Desk Review and Secondary Data Gathering

Before collecting primary data, the researcher reviewed secondary information on the subject at hand. For purposes of triangulation and identifying key deliverables for the research, desk review was conducted. Literatures (books, workshop papers, journals, electronic sources) on horizontal urban expansion, peri-urban food security and livelihood in similar areas were reviewed.

3.5 Ethical considerations

The researcher in this study acknowledged all the resources referred to and used. Further, the researcher used her own language to express and link ideas.

Moreover, throughout the entire study, the researcher will followed the three basic principles of research ethics (respect, beneficence, and justice). Thus, the process of data collection, analysis, and dissemination of findings were conducted in a way that protects respondents and maintains the anonymity and confidentiality of their personalities. The researcher and data collectors requested explicit consent if the respondents were willing to take part in the data collection processes and it was the up on each respondent's approval the data collection was done.

3.6 Sampling technique and sample size determination

3.6.1 Sample size determination

According to the Legatafo town city administration, from 2010 to 2020, about 880 households (230 women and 650 men households) displaced from their faming lands due to horizontal urban expansion Addis Ababa, since the total population is known, the sample size of targeted respondents was determined by using Yamane's formula (1967), formula at 95% confidence interval, degree of variability = 0.5 and level of precision =5% were used and obtained a sample size which able to represent a true population. Accordingly, the size of sample (n) calculated for this study is as follow:

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

$$n=230/ (1 +230 (0.05)^2) \quad n= 147$$

Where: n- is the sample size which is 147 to be used for this study

N- Is the displaced female-headed population size (230), and

e- Is the level of precision (sometimes called sampling error), 5%

Furthermore, 10% (10%*147) of calculated sample added to compensate non-response which will bring the total of 162 participants for this study.

3.6.2 Sampling techniques

The sampling frame for this particular study was peri-urban female-headed households that are found in Legatafo town of four kebeles. The study area, is selected purposefully and carefully so as to represent the socio-economic, cultural and political contexts of peri-urban areas surrounding Addis Ababa.

Further, multi-stage sampling was used by the researcher to identify representative samples. First all the four kebeles of Legatafo town were identified since the horizontal expansion of Addis Ababa impact all these kebeles. Thus, the four kebeles were identified as sample kebels. After deciding the study kebeles, the lists of displaced female-headed households collected from Legatafo Agricultural Office. After obtaining the list, the displaced female headed households were further stratified based on their kebeles, since the selected kebeles have different total number of displaced female headed households then proportionate stratified sampling technique was employed to identify number of households from each kebeles. Finally, for the household survey, 162 samples displaced female-headed households selected.

Table 1: Distribution of sample displace female-headed household by Kebele

S/n	Kebele name	Total displaced female headed household in each kebele	Sample displaced female headed household in each kebele	Percentage
1	Legatafo	67	47	29
2	Dembel	59	42	26
3	Ekadale	56	39	24
4	Legadadi	48	34	21
	Total	230	162	100

Sources: Computed based on the data collected from Legatafo town Agricultural Office

3.7 Method of data analysis

The data for this study was generated using both quantitative and qualitative methods. In connection to this, quantitative and qualitative techniques were used to analyze the generated data. The quantitative data were analyzed using STATA Version 14” software. With the preliminary quality control at the field level by supervisors, rigorous data validity and consistency checks such as editing, coding, and cleaning exercises were employed as part of the data quality control before starting data analysis. After such exercises, quantitative data analysis was made using descriptive statistics such as frequencies; mean and standard deviation. Findings from the data analysis are presented with the help of tables.

In addition, the female-headed household food insecurity situation of the study area was analyzed by using food gap months, Household Food Insecurity Access Scale (HFIAS) and Coping Strategy Index.

HFIAS which according to Abafita and Kim (2014) identifies three key domains of household access to food: perception of insufficient quantity of food, perception of inadequate quality of food and uncertainty about whether the food budget supply is adequate to meet basic requirement. Thus, the rationale for using HFIAS as an indicator for food insecurity (food access) was that the targeted population for this study were displaced female-headed households who were in the lower-income groups of their community and often struggle with uncertainty about the provision of food to their houses on a daily basis since they have lost their main source of livelihood, which was agricultural land.

According to (FANTA 2007), HFIAS can be described as a tool that consists of nine standardized questions asks respondents to identify behaviors, attitudes and psychological manifestations that relate to the domains of food insecurity, (mild food insecurity, moderate food insecurity and severe food insecurity). The nine standardized questions address the food security situation of all household members over the previous 30 days.

The HFIAS score variable is calculated for each household by summing the codes for each frequency-of-occurrence question. The maximum score for a household is 27 (the household response to all nine frequency-of-occurrence questions is “often”, coded with response code of

3); the minimum score is 0 (the household responded “no” to all occurrence questions, frequency-of-occurrence questions were skipped by the interviewer, and subsequently coded as 0 by the data analyst.) The higher the score, the more food insecurity (access) the household experienced. The lower the score, the less food insecurity (access) a household experienced (Hassenh, 2020: 22).

In order to classify the peri-urban female headed households into the four food insecurity status i.e food secure, mildly food insecure, moderately food insecure and severely food insecure, the study employ ordered logit regression model.

The ordered logit model is used to forecast an ordinal dependent variable given one or more independent variables. Ordinal regression was allowing us identify, which of our independent variables (if any) had a statistically significant influence on the dependent variable. The dependent variable is assessed on an ordinal level. The four independent variables are categorical or ordinal. The independent variables are strongly correlated with each other, proportionate odds i.e. that each independent variable has a similar influence at each cumulative split of the ordinal dependent variable (Gujarati, 2004).

In this research, ordered logit model was used to evaluate the relationship between the food security statuses of households. The food security status was categorized into four: Food secured, mildly food in secured, considerably food in secured and food in secured. Hence, the ordered logit groups dependent variables in to four: 1 for food secure (does not or rarely worries about food shortages), 2 for mildly food secure (sometimes or often worries about not having enough food), 3 for moderately food insecure (sacrifice quality more frequently) and 4 for severely food insecure (cutting down on meal size or on the number of meals)

The ordered logit model examined relationships between food insecurity and household demographic and socioeconomic factors. Ordered logit is a generalization of the logit analysis to the case of more than two categorical outcomes of an ordinal dependent variable. The dependent variable, Food secure, was ranked from the following list: Food Secure, Low Food Insecure, and High Food Insecure. Suppose the underlying relationship to be characterized is,

$$y_i = X_i \beta + \varepsilon_i \text{-----}(1)$$

Where y_i is the exact but unobserved dependent variable; X_i is the vector of independent variables, β is the vector of regression coefficients which we wish to estimate and ε_i is the error term such that ε_i is identically and independently distributed as $N(0; 1)$. Further suppose that while we cannot observe y^* , we instead can only observe the categories of response

$$y_i = \begin{cases} 1 & \text{if } y_i^* \leq \mu_1 \text{ (food secure)} \\ 2 & \text{if } \mu_1 \leq y_i^* \leq \mu_2 \text{ (mildly food insecure) -----}(2) \\ 3 & \text{if } \mu_2 \leq y_i^* \leq \mu_3 \text{ (moderately food insecure)} \\ 4 & \text{if } y_i^* > \mu_3 \text{ (severely food insecure)} \end{cases}$$

Here, 1, 2, 3, and 4 are the levels (FS, MiFI, MoFI, and SFI), μ_1 to μ_3 are threshold values (cut-off points) to be predicted for any of the HFI levels.

To assess the collinearity of variables, two measures are generally proposed to evaluate the presence of multi-collinearity of the variables. Variance Inflation Factor (VIF) for connection among the explanatory factors and the contingency for dummy variables in this research. Variance inflation factor was used to assess multi-collinearity issue for continuous and dummy variables.

Following Gujarati (1995), VIF is defined as:

$$1/(X_j) = [2] \text{-----} (1)$$

$1 - R_j$ Where:

X_j = the j th quantitative explanatory variable regressed on the other quantitative explanatory variables.

R^2_j = the coefficient of determination when the variable X_j regressed on the remaining explanatory factors. As a rule of thumb, if the VIF of a variable exceeds 10 that variable is considered to be extremely collinear and it may be assumed that multi-collinearity is an issue (Gujarati, 1995). It is also obvious that there can be interaction among qualitative factors, which might lead to the issue of multi-collinearity. To discover this issue, contingency coefficients were calculated for each pair of qualitative variables.

The Coping Strategy Index (CSI) computed on the basis of a seven days recall period of a series of questions asked to respondents to know the coping strategies of food shortages employed by displaced female-headed households in the study area.

The CSI takes into account the frequency and severity of individual coping strategies employed to deal with food insecurity. The scale used here is based on ten coping strategies. The index is calculated as a weighted average of the number of days a strategy was employed, where the weights reflect the severity of food insecurity associated with each strategy with a higher score reflecting higher frequency and greater severity of coping strategies undertaken by the household.

$$CSI = \frac{\sum (frequency\ category_i * Severity\ weight)}{Total\ number\ of\ household\ surveyed} \dots \dots \dots (3)$$

Though there is no a cutoff point for CSI to give a judgment, in this study the CSI score is scaled from 0 to 80, based on People in Need (PIN) Indikit, i.e 0-40 low CSI, 41-80 medium CSI and > 80 high CSI

The qualitative data gathered from both FGDs and KIIs were checked for accuracy and completeness and the data were typed by using the word processor and then mapped against key questions and are summarized into major categories/themes for content analysis and interpretation. Following the separate analyses of quantitative and qualitative data, the integration of findings was made to bring different types of data together to build a more dimensional analysis of findings.

CHAPETER FOUR: RESULTS AND DISCUSSIONS

Introduction

Under this chapter the major results and discussions of the study are presented. The chapter is divided into three sub-sections. The first sub-section describes the socioeconomic and demographic characteristics of the sample female-headed households. The second sub-section presents the household food security situation in terms of Household Food Insecurity Access Scale (HFIAS) and Coping Strategy Index (CSI) of displaced female-headed households in Legatafo town.

4.1 Demographic and socio-economic characteristic of the sample female-headed households

Demographic and socio-economic characteristics of households such as age, sex, educational status, and family size, farm land holding size, livestock ownership, and income from on-farm and off-farm activities are the most important variables that needs to be assessed to see the their impact on the food in/security situation of the displaced household. With this regard, the above seven variables examined to see their level of significance on the food in/security situation of displaced indigenous women farmers of Legatafo town.

Age of the household head: is one of the expected variables that determine the food security situation of any household. This study results shows that a minimum and maximum age of 20 and 72 years respectively with a mean age of 40.93 years and standard deviation 9.93.

As shown in table 2 below, the majority of the respondents, i.e., 139 (84.57%) are in the adult age group i.e from 30-65 years which is the most active age. About 16 (9.88%) of them are in between 20-29 years of age, indicating the youth part of the respondents. The national adolescent and youth health strategy (2016) classifies youth those between the ages of 15-29 years. The rest 9 (5.55%) are in the older age category of > 65 years. Overall, about 94.45% of the respondents are within the economically active age group of 20-64 years, which is the most productive age that individuals can be engaged in a various economic activities to ensure their household food and livelihood security.

Table 2: Distribution of sample FHHH by age and food security status

Educational level of FHHH	Household food security status									
	Food Secure		Mildly food insecure		Moderately food insecure		Severely food insecure		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
20-29 Years	0	0	3	18.75	4	25	9	56.25	16	9.88
30-65 Years	11	7.91	22	15.83	33	23.74	73	52.52	139	85.80
> 65 Years	0	0	0	0	2	28.57	5	71.43	7	4.32
Total	11	7.91	25	15.43	39	24.07	87	53.70	162	100

Sources: field survey result

Pearson chi2(6) = 3.5647 Pr = 0.735

Several literatures such as Abdullah et al., (2017) found that the food security situation of a household led by an adult household head is much better than an older household head. The main reason for this is that the adult households have higher chance of involving in various on-farm, off-farm and non-farm economic activities.

This study measures the degree to which the age of the displaced female headed households could affect their household food security situation. A chi-square measure was used to determine if there is a significant relationship between the age categories of the displaced female-headed households and their food security situation.

Table 2 above indicated that about 93.2% of the displaced female-headed households are food insecure (mildly, moderately or severely food insecure). Also the table depicts regardless of their age 92.09% of the adult age group (the economically active group) were found as food insecure (mildly, moderately or severely food insecure). This finding further substantiated by the Focus Group Discussions (FGDs) and Key Informant Interview (KII) conducted on June 4 and June 16, 2022 respectively. The qualitative findings confirmed that irrespective of their age, most of the displaced female-headed households became food insecure, and this was due largely to the intensive peri-urbanization process of Legatafo town, which forced all farmers in general and female-headed households in particular to fall in poverty as most of them lost the main sources of their food and livelihood security, i.e farmland without adequate supporting system in place.

Educational level of the head of the household: is another variable that needs to be examined to see the food security situation of a household. Accordingly, respondents were asked to report the highest level of education completed so far.

In this regard, the study found that more than half of the respondents, i.e., 88 (54.32%) are unable to read and lack basic reading and writing skills. About 14 (8.64%) respondents have attended non formal education and 46 (28.40%), 13 (8.02) and 1(0.62%) of respondents have completed their primary school, secondary school and higher education respectively.

Household head education level is believed to be an important variable that determines a household's food security. Several studies have proven that as the educational level of a household increases; the food security of that household also increases. However, this study found no significant association between the education level of the displaced female-headed farmers and their food security status in Legatafo town.

The results of the survey in Table 3 show that about 97.67% of the unable to read, 85.71% with no formal education, 93.48% with primary school, 84.62% with secondary school, and 100% with higher education respectively were found as food insecure households (mildly, moderately, or severely food insecure). This can also be explained by the fact that the displaced female-headed households who have lost their farmland, with little or no supportive system in place, became food insecure regardless of their educational level due to loss of basic resource (farmland). Findings from the FGDs and KII supported this result that the majority of the displaced female-headed farmers were food insecure.

This is explained by the fact that most of the displaced women don't have other types of life skills than farming to rely on or enable them to transition into new businesses outside of agriculture.

Table 3: Distribution of sample households head by educational level and food security status

Educational level of FHHH	Household food security status									
	Food Secure		Mildly food insecure		Moderately food insecure		Severely food insecure		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Unable to read	2	2.33	12	13.95	22	25.58	50	58.14	86	53.09
Non-formal education	2	14.29	3	21.43	1	7.14	8	57.14	14	8.64
Primary School	3	6.52	8	17.39	10	21.74	25	54.35	46	28.40
Secondary School	2	15.38	2	15.38	5	38.46	4	30.77	13	8.02
Higher Education	0	0	0	-	1	100.00	0	-	1	0.62
Total	11	6.79	25	15.43	39	24.07	87	53.70	162	53.09

Sources: field survey result

Pearson chi2 (12) = 11.3958 Pr = 0.495

Family size of a household is another important variable that this study surveyed to see how it affects the food security status of the displaced female-headed farming households. In this regard, respondents were asked about their family size. The survey result shows the minimum and maximum total family sizes of 1 and 7 respectively with an average of 4.8 which is very close to the national average of family size, 5 persons per household (CSA, 2007).

As shown in Table 4, below only 1.2 % (2) has a household size of 1 whereas 6.79% (11) have a household size of 2, 14.81% (24) have a household size of 3, 17.28 % (28) have a household size of 4, 20.99% (34) have a household size of 5, 28.40% (46) have a household size of 6 and 10.49% (17) have a household size of 7.

This data shows that about 59.88% of the displaced female-headed farming households have 5 and above dependents and the household size per female-headed household in general was high since the national average household size is 4.8 persons (CSA, 2012).

Table 4: Household size of respondents

Family Size	Frequency	Percentage
1	2	1.23
2	11	6.79
3	24	14.81
4	28	17.28
5	34	20.99
6	46	28.40
7	17	10.49
Total	162	100

Sources: field survey resul

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Table 5 below presents the survey results for household family size in relation to their food security status. Of the respondents with low family sizes, 83.20% of them were (mildly, moderately, or severely) food insecure. Similarly, 86.88% of respondents with large families were (mildly, moderately, or severely) food insecure

According to Getaneh et al., (2022), a large family size puts an extra burden on food consumption and is more likely to experience food insecurity in contrast to households with a small family size. Indeed, in this survey result, there is a very slight difference (3.69%) between the small and large family sizes in terms of their food security situation. Thus, this can be translated as the family size of the displaced female-headed households doesn't have a bigger impact on their level of food security status, and both family size categories require more resources to meet their food and nutritional needs

Table 5: Household family size in relation HH food security status

Household family size	Household food security status									
	Food Secure		Mildly food insecure		Moderately food insecure		Severely food insecure		Total	
	No.	%	No.	%	No.	%	No	%	No.	%
Low family size, 1-4 (below the national average)	2	3.08	12	4.73	19	29.23	32	49.23	65	40.12
High family size, 5-7	9	9.28	13	9.57	20	20.62	55	56.70	97	59.88
Total	11	6.79	25	4.19	39	24.07	87	53.70	162	100.00

Sources: field survey result

Pearson chi2 (3) = 4.4534 Pr = 0.216

Agricultural land holding size: Agricultural land holding size is the most important factor that determines the state of household food security in the urban and peri-urban contexts. In this regard, surveyed respondents were asked to report if they have their own farmland and how many hectares. Consequently, 94 (58.03%) of the respondents have their own farmland and the remaining 68 (41.98%) of the respondents become landless due to the development of peripheral areas of Legatafo town.

The average farmland size owned by the displaced women farmers was found to be 0.23 hectares with the minimum and maximum farmland size of 0.02 and 1.5 hectares respectively. As depicted in table 6 below, out of the 94 respondents who have farmland, 91 (96.8%) of them do currently have land size ≤ 0.38 hectares which is below the national average farmland size i.e. 0.96 hectares (CSA, 2007). In the survey, 90.42% of respondents answered that they don't harvest sufficient crop from their land where as 9.57% of them relatively harvest sufficient crop that support their household for a year.

Focus group discussants claimed that their land ownership had been significantly reduced or they had lost land due to Addis Ababa's expansion towards Legatafo town. Those who have farming land affirmed that their small plot of land is not enough for crop production and animal rearing.

Those who become landless also confirm that the small off-farm businesses in which they are engaging is not adequate enough to support their household dependents.

Table 6: Landholding size of respondents

Agricultural land size in hectare	Frequency	Percentage
< 0.025	50	30.86
0.025-0.52	23	14.20
0.53-0.95	18	11.11
> 0.95	3	1.85
Become landless	68	41.98
Total	162	100

Sources: field survey result

As shown in Table 7 below, there is a strong correlation between farmland size and food security. The results in the table show that 80%, 47.83%, 38.89% and 70.59% of the respondents who owned < 0.025, 0.025-0.52, 0.53-0.95 and no hectares of land respectively are under the moderately or severely food insecure category. This means that the expansion of Addis Ababa into the town of Legatafo has forced many female-headed farmers to lose significant income from crop production. (Yirgu, 2014:38) states that larger farmland size increases the likelihood of households being food secure, and the reverse is also true.

Table 7: Household farm landholdings in relation HH food security status

Agricultural land size in hectare	Household food security status									
	Food Secure		Mildly food insecure		Moderately food insecure		Severely food insecure		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
< 0.025	0	-	2	4.00	16	32.00	32	64.00	50	30.86
0.025-0.52	2	8.70	7	30.43	6	26.09	8	34.78	23	14.20
0.53-0.95	4	22.22	4	22.22	4	22.22	6	33.33	18	11.11

>0.95	5	-	0	-	0	-	3	100.00	3	1.85
Become landless	5	7.35	12	17.65	13	19.12	38	55.88	68	41.98
Total	11	6.79	25	15.43	39	24.07	87	53.70	162	30.86

Sources: field survey result

Pearson chi2 (12) = 26.8263 Pr = 0.008

Large and Small livestock holding: is also an important source of food security in the peri-urban context. It contributes as source of nutrition and income. Besides crop production, survey respondents were asked about their ownership of large livestock (ox and cow) and small livestock (sheep, goat and chickens). As shown in table 8 below, 112 (69.14%) and 40(24.69%) of respondents don't possess any types of large and small livestock respectively. Large livestock <2, 2-7 and >7 possessed by 33(20.37%), 12 (7.41%) and 5 (3.09%) respectively and small livestock <2, 2-7 and >7 possessed by 85 (52.47), 26(16.05) and 11 (6.79%) respectively. In connection to this, only 50(30.86%) of them own large livestock and 112 (75.31%) of respondents own small livestock of which 85 (52.47%) of them own less than 2 livestock.

Table 8: Distribution of respondents by large and small livestock ownership

No. of Livestock owned by the HH	No. of Large Livestock		No. of Small Livestock	
	Frequency	Percentage	Frequency	Percentage
< 2	33	20.37	85	52.47
2-7	12	7.41	26	16.05
>7	5	3.09	11	6.79
No livestock	112	69.14	40	24.69
Total	162	100	162	100

Sources: field survey result

According to Getaneh et al., (2022), households with relatively large livestock size are less vulnerable to food insecurity, and it was hypothesized that livestock positively determine households' food security. However, the study found that there is no strong association between livestock ownership and the displaced female-headed household's food security.

As shown in table 9 below, in each large livestock ownership category, more than 80% of them are mildly, moderately, or severely food insecure. As explained by the FGD respondents, they

can't rear more than 2 or 3 small or large livestock as most of them are living in a rental house, if not, the land they own is not adequate for livestock rearing.

Table 9: Household livestock ownership in relation HH food security status

Large livestock ownership	Household food security status									
	Food Secure		Mildly food insecure		Moderately food insecure		Severely food insecure		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
< 2 livestock	5	15.15	7	21.21	6	18.18	15	45.45	33	20.37
2-7 livestock	0	-	2	16.67	3	25.00	7	58.33	12	7.41
> 7 livestock	1	20.00	2	40.00	0	-	2	40.00	5	3.09
no Livestock	5	4.46	14	12.50	30	26.79	63	56.25	112	69.14
Total	11	6.79	25	15.43	39	24.07	87	53.70	162	100.00

Sources: field survey result

Pearson chi2(9) = 12.4977 Pr = 0.187

Annual agricultural (crop and livestock) income is another variable that needs to be assessed to triangulate the outcomes associated with household annual crop yields and livestock ownership verse household food security status. As shown in table 10, 121(74.69%) of the respondents don't have agricultural income and 15(9.26%), 12(7.41%) and 14(8.64%) of them have low, medium and high agricultural income respectively.

Table 10: Respondent's agricultural income

Annual agricultural income	Frequency	Percentage
No income	121	74.69
500-1000 birr (low income)	15	9.26
1001-2000 birr (medium income)	12	7.41
>2000 birr (high income)	14	8.64
Total	162	100

Sources: field survey result

Table 11 below shows that there is a strong association between agricultural income of the displaced female-headed households and their food security situation. Out of 121 respondents who don't have agricultural income, 117(96.69%) of them are food insecure (mildly, moderately or severely). 15(100%) of respondents in the low agricultural income category are also food insecure (mildly, moderately or severely). 11(91.67%) and 8(57.14%) in the medium and high agricultural income category were respectively food insecure (mildly, moderately or severely). This indicates that the majority (93.21%) of the respondents are food insecure mildly, moderately or severely) irrespective of their income.

Table 11: Report on sample household's annual agricultural income in relation to their food security

Annual agricultural income	Household food security status									
	Food Secure		Mildly food insecure		Moderately food insecure		Severely food insecure		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
No income	4	3.31	13	10.74	32	26.45	72	59.50	121	74.69
500-1000 birr (low income)	0	-	4	26.67	4	26.67	7	46.67	15	9.26
1001-2000 birr (medium income)	1	8.33	3	25.00	2	16.67	6	50.00	12	7.41
>2000 birr (high income)	6	42.86	5	35.71	1	7.14	2	14.29	14	8.64
Total	11	6.79	25	15.43	39	24.07	87	53.70	162	74.69

Sources: field survey result

Pearson chi2 (9) = 44.6817 Pr = 0.000

The non-agricultural income of the targeted respondents was also surveyed to understand other sources of income that the households are utilizing to ensure their household food security. Survey respondents were asked if they engage into other non-agricultural income generating activities and as it is shown in table 12 below, the majority 145, (89.51%) of respondents do have a monthly income from non-agricultural activities. 49 (30.25%), 41 (25.31%), and 55 (33.95%) of the sampled respondents generate birr 500-1000, birr 1001–2000, and > birr 2000,

respectively. The engagement of the majority of the displaced female-headed households in non-agricultural activity might be because of the reduction or loss of agricultural lands as a result of the extensive peri-urbanization of Legatafo town. As explained by the focus group discussions, most of the displaced female-headed involved in various small income generation activities by buying and selling good in the local market.

Table 12: Distribution of respondents by off-farm income

Average monthly off farm income	Frequency	Percentage
No income	17	10.49
500-1000 birr (low income)	49	30.25
1001-2000 birr (medium income)	41	25.31
>2000 birr (high income)	55	33.95
Total	162	100

Sources: field survey result

The results presented in table 13 below indicated that there is no strong relationship between the non-agricultural incomes and food security of the targeted households. This fact may be associated with the possibility that the displaced female-headed households are not making a significant income that enables them to ensure their household food security. This was also elaborated through the key informant interview discussion, the fact that the current price escalation in various commodities is challenging the women to make viable income and businesses, the low purchasing power of the local currency, and the high inflation of food costs expose the displaced female-headed households to a high level of food insecurity. Table 13 shows that 151 (93.21%) of the respondents are food insecure (mildly, moderately or severely) irrespective of their monthly non-agricultural incomes.

Table 13: Monthly non-agricultural income in relation to respondent's food security situation

Non-agricultural income	Household food security status									
	Food Secure		Mildly food insecure		Moderately food insecure		Severely food insecure		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
No Income	2	11.76	3	17.65	4	23.53	8	47.06	17	10.49
500-1000birr low income	1	2.04	7	14.29	14	28.57	27	55.10	49	30.25
1001-2000 birr medium income	5	12.20	6	14.63	10	24.39	20	48.78	41	25.31
>2000 birr high income	3	5.45	9	16.36	11	20.00	32	58.18	55	33.95
Total	11	6.79	25	15.43	39	24.07	87	53.70	162	100

Sources: field survey result

Pearson chi2 (9) = 5.6421 Pr = 0.775

In this study, variables that have a direct impact on any household's food security or insecurity status, such as food aid, remittances, and illness of household members, were further examined. The summary of data in table 14 below shows 149 (91.98%) and 154 (95.6%) of the respondents did not receive any type of food aid and remittance, respectively, in the past 12 months, in which these two variables did have a direct relation with household access to food. This result can be interpreted as more than 90% of respondents were food insecure relation of food aid and remittance.

People in food-insecure households have a high possibility of getting sick; table 14 below presents 113 (69.75%) respondents got sick in the past six months, which directly translates into the likelihood of these female-headed households being food insecure, is very high.

Table 14: Summary of food aid, remittance and sickness in relation to household food security

Response of respondents	Received food aid in the past 12 months		Received remittance in the past 12 months		HH member sick in the past 6 month	
	No.	%	No.	%	No.	%
Yes	13	8.02	7	4.32	113	69.75
No	149	91.98	154	95.65	49	30.25
Total	162	100	162	100	162	100

Sources: field survey result

4.2 Food security/insecurity situation

Agriculture used to be the main source of food and livelihood security for the displaced female-headed farmers in Legatafo town. However, the expansion of Addis Ababa into the town of Legatafo has forced many women farmers to leave their farmlands and turn to other income-generating activities to secure their food and livelihoods. To examine the impact of peri-urbanization process of Legatafo town on the food security situation of the displaced female-headed farming households, this study employed food gap month analysis, HFIAS and CIS tools.

4.2.1 Food gap analysis

To understand the food gap of the displaced female-headed farming households, the women were asked about the number of months that they can feed their families from any sources of income (agricultural and non-agricultural income) in 12 months of a year. The survey result indicates that the average food gap months are found to be 4.60 months with a minimum and maximum food gap of 0 and 8 months respectively. As shown in Table 15 below, the five food gap months frequently mentioned by the respondents were January, February, March, April and May. Considering the sample size and months of food gap, about 70.37 % of the displaced female-headed households were food insecure.

Table 15: Reported food gap months of sample households

Food gap months	Frequency	Percentage
January	13	8.02
February	22	13.58
March	26	16.05
April	27	16.67
May	26	16.05
June	19	11.73
July	10	6.17
August	7	4.32
September	1	0.62
October	2	1.23
November	3	1.85
December	6	3.70
Total	162	100.00

Sources: field survey result

4.2.2 Household Food Insecurity Access Scale (HFIAS)

Besides knowing the food gap months, the study examined the Household Food Insecurity Access Scale (HFIAS), to measure the level of food security of the displaced female-headed farming households. HFIAS was used as an indicator to measure household food security status. It reflects food access and availability at household level.

Table 16 below shows that in the past 30 days, 11(6.79%) of respondents were food secure and do not or rarely worried about food shortages in their household. 25(15.43%) of respondents were mildly food insecure and were in anxiety and worried about enough food supply to their household, 39(24.07%) of were moderately food insecure and they were supplying insufficient quality, less variety and less preferred foods. The remaining 87(53.70%) households were severely food insecure and supplying insufficient quantity of food with reduced intake.

As shown in Table 16, the overall HFIAS food insecurity rate was 93.21%, which means that 151 of the sample respondents were food insecure. According to Negesse et al., (2020) the pooled prevalence of food insecurity among female-headed households in Ethiopia was 66.11%

and this indicates that there is a very deep level of food insecurity among the displaced female-headed farming households in Legatafo as compared with the national figure.

Table 16: Classification of the respondents by their food insecurity status

HFIAS Category	Frequency	Percentage	Incidences
Food secure	11	7	do not or rarely worried about food shortage
Mildly food insecure	25	15	were in anxiety and worried about enough food supply
Moderately food insecure	39	24	were supplying insufficient quality, less variety and less preferred foods
Severely food insecure	87	54	supplying insufficient quantity of food with reduced intake
Total	162	100.00	

Sources: field survey result

As explained in the techniques of data analysis, ordered logit regression was used to model the association of targeted household socio-demographic and economic variables with their food security in Legatafo town. Table 17 below shows that out of the thirteen explanatory variables that were fed in the model, six of them impacted the food security of the displaced female-headed households at a different level of significance.

Agricultural land ownership has a statistically significant effect on food security of female-headed households, at $p < 0.01$ being negatively associated with food security. According to a USAID briefing paper (2013: 5), female landholdings are associated with increases in household food security. However, this study found that though 58% of the respondents own agricultural land of various sizes they still are food insecure, the study result found that out of the 58% of respondents who own agricultural land 56.17% of them have agricultural land ranging from 0.02-0.095 hectares, which doesn't provide enough crop production to insure food security for their households. Further, the FGDs and the KII conducted confirmed that this situation real at ground level and it is related to the size of their land, poor quality of the land and the women also are not using the land for crop cultivation since most of them don't afford the labor cost for farming.

Agricultural land holding size; the study found there is a positive association between agricultural land size and food security. The study reveals that agricultural land size increases the food security of female-headed households and it is significant at $p < 0.05$ and this indicated a strong relationship between the two variables. This result is in line with other studies conducted in Ethiopia such as FSS policy brief (2020) stated that food security is positively correlated with landholding size; increase in land size is associated with improvement in food security status. Compared to households that have land sizes of less than one hectare, those that have one to two hectares of land had 59% higher chances of being food secure.

Ownership of large livestock is positively correlated with the food security status of the respondent's household. Awoke et al., (2022) asserted that households with more oxen are much better able to generate better income and better food security. The findings of this study show that, while this variable is positively correlated with the respondent's food security status, its level of significance at $p < 0.1$ is minor, since respondents who own large livestock have 1 or 2 and this have little impact on household food security in relation to the average respondent's size of the household.

Ownership of small livestock compared with the ownership of large livestock, the ownership of small livestock was negatively correlated with the food security status of targeted female-headed farmers in Legatafo town. But other studies like Wodajo et al., (2020) confirm that small animal ownership has a positive association with household food security. In this study, the estimated coefficient for this variable is found to be slightly significant at $p < 0.1$ and this might be due to unforeseeable factors. The study triangulated and proved this result through the collected data of FGDs and KII, which firmly agree that keeping small livestock doesn't contribute much to the food security status of the displaced female-headed as most of them live in rental houses and couldn't keep more than 2 or 3 small livestock.

Annual crop production was found to be positively correlated with household food security status and was slightly significant at $p < 0.1$. Though studies such as Adhikari et al., (2018) confirmed that crop production has a positive and strong association with the food security of a household, this study finding revealed that the contribution of crop production to the food

security status of the targeted respondents is not adequate, and this corresponds with the findings in agricultural land ownership, i.e small size and poor quality of agricultural land, and minimal crop cultivation due to a lack of labor.

Annual farm income found to be statistically significant at $p < .05$ and it was negatively associated with the displaced female-headed household's food security status. A negative coefficient implies that there is a strong correlation between ownership of good-quality and productive agricultural land and agricultural income.

Table 17: Ologit regression analysis of socio-demographic and economic variable on food security situation of respondents

Ordered logistic regression							
Variable	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
AgeHHH	.043	.028	1.56	.119	-.011	.097	
Family size	.118	.187	0.63	.53	-.249	.484	
Education LHHH	.249	.231	1.08	.28	-.203	.701	
Agri.LO	-1.925	.52	-3.70	0	-2.944	-.905	***
Agri.LH	3.408	1.604	2.12	.034	.263	6.553	**
Large LO	.314	.18	1.74	.081	-.039	.668	*
Small LO	-.392	.214	-1.83	.067	-.812	.027	*
Crop Pro.Yr	1.717	1.003	1.71	.087	-.249	3.683	*
Annual Farm Income	-.682	.281	-2.43	.015	-1.233	-.132	**
Avg. mon. off-far. income	.026	.238	0.11	.912	-.44	.493	
Food aid	-.828	.952	-0.87	.384	-2.693	1.037	
Remittance	-1.292	2.719	-0.48	.635	-6.621	4.037	
Sickness HHM	.578	.528	1.10	.273	-.456	1.613	
Mean dependent var.	2.247						0.928
Pseudo r-squared	0.187						162
Chi-square	40.015						0.000
Akaike crit. (AIC)	205.802						246.324

Sources: computed from field survey data, 2022.

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

The variables that have significant influence on the food security status of the displaced female-headed farming households in Legatafo town are present in table 18 below. The statistical significance of the coefficients and the marginal effects of explanatory variables that have substantial impact on the food insecurity status of the targeted respondents were discussed accordingly; agricultural land ownership, agricultural land size in hectares, large livestock ownership, small livestock ownership, crop production per year and annual farm income

Agricultural land ownership: the study result shows that in the context of the study area, ownership of agricultural land has a negative association with the targeted respondent's household food security at $p < 0.01$. This finding indicates that households that have agricultural land are more likely to be food insecure than those that don't possess agricultural land. Table 19 shows that a unit increase in agricultural land ownership increases the probability of displaced female-headed households being FS, MFI, and MoFI by 4.70%, 18.60% and 24.81% respectively. It, on the other hand, reduces the likelihood of targeted respondents being SFI by 48.5%. The information generated from the FGDs and KII revealed that most of the respondents own a very small size of agricultural land of poor quality. Thus, ownership of agricultural land is not alone a guarantee for household food security.

Agricultural land holding size: is positively associated with the displaced female-headed household's food security status at $p < 0.05$. A hectare increment of land size will reduced the FS, MFI and MoFI by 8.3%, 32.93% and 43.94% respectively. In contrast, it will increase the food security of SFI households by 85.14% and this find is consistent with other researches conducted in Ethiopia such as Awoke et al., (2022).

Ownership of large livestock is positively correlated with the food security status of the respondent's household and it is statistically it is slightly significant at $p < 0.1$. As it is indicated in table 18 below, if a household adds one more larger livestock, the probability of being FS, MFI and MoFI reduced by 0.8%, 3% and 4% respectively. On the other hand, the likelihood of being FS by SFI households will increase by 7.8% with additional of one more livestock. As per the FGD result, the number of large livestock owned by FS, MFI and MoFI households is very low to the level it couldn't significantly contribute to the household food security.

Further, table 18 below depicts that an additional small livestock in a targeted household increases the probability of the displaced female headed households FS, MFI and MoFI by 1%, 3.8% and 5% respectively. Whereas a unit increment of small livestock decrease the likelihood of households being SFI by 9.8%. the FGD and KII results revealed that in their current contexts, most of the respondents are unable to increase their small livestock more than what they have now since as most of them are living in rental housed while increasing the small livestock in the SFI HH from nil to 1 or 2 enhance their food security status.

Crop production was found to be positively correlated with household food security status and was slightly significant at $p < 0.1$. The results presented in table 18 indicate that an increase in yearly crop production reduces the probability of targeted respondents being FS, MFI and MoFI by 4.2%, 16.6% and 22.14% respectively. Inversely, the likelihood of an increase in yearly crop production, increases being SFI by 42.89%

Annual farm income found to be statistically significant at $p < .05$ and it was negatively associated with the displaced female-headed household's food security status. The negative coefficient implies that the targeted households are not generating significant income form agricultural products. Table 18 shows that a unit increases in the level of annual farm income on-will increase the likelihood of the household being FS, MFI and Mo.FI by 1.7%, 6.59% and 8.79% respectively. To the contrary, it will decrease the likelihood of SFI by 17.04 this indicates that if SFI household got the opportunity to involve in farming activity their level of being food secure will increase and this finding is consistent with several findings such as Samim et al., (2021) asserted that one additional unit increase in farm income (yearly) raises the likelihood of experiencing food security and mild food insecurity (marginally food secure) and reduces the susceptibility of farm households to moderate and severe food insecurity

Table 18 Household Food Insecurity Access Scale (HFIAS)

		Food Secure (FS)	Mildly Food Insecure (MFI)	Moderately Food insecure (MoFI)	Severely Food Insecure (SFI)
Variable	Coefficients	dy/dx	dy/dx	dy/dx	dy/dx
AgeHHH	.043	-0.001	.0041443	-.0055287	.0107131
Family size	.118	-0.003	-.0113649	-.0151611	.0293783
Education LHHH	.249	-0.006	-.0240666	-.0321057	.0622124
Agri.LO	-1.925***	0.047	.1860179	.2481543	-.480858
Agri.LH	3.408**	-0.083	-.329386	-.4394121	.8514656
Large LO	314*	-0.008	-.0303867	-.0405369	.0785499
Small LO	-.392	0.010	.0379325	.0506032	-.0980558
Crop Pro.Yr	1.717*	-0.042	-.1659459	-.2213775	.4289716
Annual Farm Income	-.682**	0.017	.0659348	.0879593	-.1704421
Avg. mon. off-far. income	.026	-0.001	-.002546	-.0033965	.0065815
Food aid	-.828	0.020	.0800005	.1067234	-.206802
Remittance	-1.292	0.031	.1248718	.1665833	-.3227948
Sickness HHM	.578	-0.014	-.0558865	-.0745545	.1444672

Sources: computed from field survey data, 2022.

4.2.3 Consumption Coping Strategies (CSI)

In time of food shortages, households employ different coping strategies. Coping strategies can help people adjust to stressful events while helping them maintain their emotional well-being. In Ethiopia, the peri-urban households (HHs) have been using food insecurity coping strategies such as selling of live animals to purchasing food grain, borrowing, participate in off-farm activities, seeking relatives and friends support, change in feeding habit, and reducing the amount to be consume.

According to Maxwell (2008) The CSI takes into account the frequency and severity of individual coping strategies employed to deal with food insecurity. The scale used in this study was based on ten coping strategies annexed in this research. Respondents are asked to report how

many days in the last seven they employed each strategy. The index is calculated as a weighted average of the number of days a strategy was employed, where the weights reflect the severity of food insecurity associated with each strategy. Based on the context of the study area, this research scaled the CSI score from 0 to 80. Households scored 0-40 reflects lower frequency and smaller severity of coping strategies, those scored 41-80 reflects medium frequency and moderate severity of coping strategies and households scored > 80 reflects higher frequency and greater severity of coping strategies.

The results in Table 19 below show that CSI was significantly higher for displaced female-headed households during the study period. 115(70.99%) respondents had high CSI scores, meaning they were using harmful coping strategies and had higher levels of food insecurity compared to households with moderate and low CSI scores whereas 26 (16.05%) and 21 (12.96%) of the respondents used relatively moderate and harmless copying strategies respectively.

Table 19: Household coping strategies score for food shortages

Copying Strategy (CS) Scores	Frequency	Percentage
0- 40 Low CS	21	12.96
41-80 Medium CS	26	16.05
>80 high CS	115	70.99
Total	162	100.00

Sources: field survey result

4.2.4 Correlations between HFIAS and CSI

In this study Household Food Insecurity Access Scale (HFIAS) and Copying Strategy Index (CSI) food security indicators have been deployed to measure the food security/insecurity situation of the displaced female-headed farming households in Legatafo town. To evaluate the consistence of the findings of the two food security indicators and validate the results obtained,

the study used Pearson Correlation Coefficient (PCC). The PCC r is 0.3075, and because r is positive, it indicates that there is a positive relationship between HFIAS and CSI, i.e., as HFIAS increases, CSI results increase, and vice versa. The (p-value) was 0.0001, and this shows that statistically there is a significant correlation between the results of HFIAS and CSI in this study.

CHAPETER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study tried to investigate the level of food security or insecurity of the displaced female-headed farming households that are affected by the peri-urbanization process of Legatafo town. Key factors such as the age of HHH, family size, educational level of HHH, agricultural land ownership, agricultural land size, livestock ownership, crop production per year, annual farm income, average monthly Off-farm income, food aid, remittance and health of HH members that determine the household food security status were assessed.

The study findings indicated that in the context of Legatafo town, the greater proportion of the displaced female-headed farming households are extremely food insecure. Key household food security determinants like the age of the head of the household, the educational level of the head of the household, family size, non-agricultural incomes, and large and small livestock ownership don't have significant impact the food security status of targeted households. The basic argument here is that the loss of agricultural land, which was the main source of food and livelihood security, impoverishes the displaced female-headed farming households irrespective of these key food security factors. On the other hand, agricultural land size, annual crop production; food aid, remittances, and the health of HH members have positive correlation with the food security situation of the household.

Further, to measure the household food security or insecurity status, the study employed a combination of household food security indicators; food gap months, the Household Food Insecurity Access Scale (HFIAS), and the Coping Strategy Index (CSI). The computed food gap months, Household Food Insecurity Access Scale (HFIAS), and Coping Strategy Index (CSI) revealed that the food insecurity situation of the displaced female-headed households in Legatafo town is extremely deep. The average food gap month among the targeted respondents was found to be 5 months, whereas the national food gap month is 3. The Household Food Insecurity Access Scale (HFIAS) showed that 93.21% of the respondents of the study were food insecure (mildly, moderately, or severely). Moreover, based on the established Coping Strategy Index (CSI) threshold, 70.99% of the study respondents scored > 80 that indicates that they are

using harmful coping strategies. The computed Pearson correlation result indicated that there is a significant correlation between the Household Food Insecurity Access Scale (HFIAS) and the Coping Strategy Index (CSI), and this confirmed the depth and severity of food insecurity among the displaced female-headed farming households in Legatafo town and it needs immediate attention of all actors (government, NGOs, donor agencies, private sectors, CBOs) to lift them out from deep poverty.

5.2 Recommendation

Based on the results of this study and the above conclusions, this study recommends the following measures to improve the food security of female-headed farming households in Legatafo town:

- a. As displaced female headed farming households are the primary victim of urban expansion, there is a need to give prior attention for these women in order to ensure their food security in a sustainable manner, an integrated action of development actors, government, and donor agencies is vital to enhance the capacity (skills, knowledge, resources), capabilities (confidence, bargaining power, collective voice) of the women so that they can fit into the new lifestyle system and not being left behind .
- b. Before any dislocation occurs in farming communities, strong supportive systems must be in place where the communities are relocated, especially systems that are responsive to the needs and priorities of female-headed farming households as their strategic need and priorities are different from other parts of the community.
- c. There must be a financial support system accompanied by business skills training to enable displaced women to engage in viable and peri-urban sensitive businesses so that they can ensure their household food security in a sustainable manner in the new settings.
- d. The food security situation of female-headed farming households displaced by the process of peri-urbanization must be further explored for unique regional and national interventions to prevent extreme food insecurity among female-headed farming households.
- e. Municipality of towns should have to give especially attention for displaced female-headed farming households during the relocation process so that the women easily can

cope and sustain with the new context without major shock to their household food and livelihood security.

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Annexes

Annex 1: Variables and description

Name of variables	Description
Age HHH	Age of Household Head
Family Size	Family Size
Education LHHH	Educational Level of Household Head
Agri. LO	Agricultural Land Ownership
Agri.LH	Agricultural Land in Hectares
Large LO	Large Livestock Ownership
Small LO	Small Livestock Ownership
Crop Prod Yr.	Crop production per Year
Annual Farm income	Annual farm Income
Avg. mon. off-far. income	Average Monthly Off-farm Income
Food aid	Food Aid
Remittance	Remittance
Sickness HHM	Sickness of Household Members

Annex 2: Multicollinearity test (VFI)

. vif

Variable	VIF	1/VIF
LSinHec	4.51	0.221762
AgriLS	3.92	0.255250
CropProdYr	1.93	0.519389
AgeHHH	1.80	0.555564
AnnualFarm~r	1.70	0.589322
SmallLives~n	1.56	0.638982
Remittance~h	1.46	0.685461
FamilySize	1.45	0.689467
EducationL~H	1.43	0.697958
Foodaid12m~h	1.34	0.745173
Sickpast6m~s	1.24	0.809146
LargeLives~n	1.24	0.809390
Avgmlyofff~e	1.16	0.858618
Mean VIF	1.90	

Annex 3: Correlation between HFIAS and CSI

. pwcorr HFIAStotal CSITotal, sig star(0.05) obs

	HFIAS~1	CSITotal
HFIAStotal	1.0000	
	162	
CSITotal	0.3075*	1.0000
	0.0001	
	162	162

Annex 4: Household Questionnaires

A. Survey Questions

Please seek consent from interviewee as follows:

"My name is _____ I am conducting a survey to assess the Food Security Situation of Female Headed Households in your locality as part of a Master Study conducted by a student at Addis Ababa University Collage of Development Studies Center for Food Security and Studies. I would like to ask you some questions which will take about 45 minutes.

We will not record your name and any information that you provide is confidential, but will be analyzed with information provided in the same way by others participating in this survey so that the outcome will not be attributed to you or others who take part in the survey.

Your participation is voluntary, but we hope you will participate since your views are important. Do you have any questions?

May I begin the interview now?" (If response is "NO", go to the next Household)

1. General information

Household ID	
Location/Kebele name	
Village name	
Date	
Enumerator's name	

2. Personal and Demographic Information of a Household

- Name of the Respondent: _____
- Gender: 1)Male 2)Female:
- Respondent is the household head? 1) Yes 2) No,
- Age of the household head: _____
- Total household members/family size: _____ Female: _____ Male: _____
- Education of Household Head:
 - 1) Unable to read _____
 - 2) Non formal Education: _____
 - 3) Primary school: _____
 - 4) Secondary school: _____
 - 5) Higher Education: _____
- Land Size of agricultural land:
 - 1) < 0.025
 - 2) 0.025-0.52
 - 3) 0.53-0.95
 - 4) >0.95
 - 5) become landless
- Ownership large livestock (Ox and cow) Yes _____ if yes

- 1) < 2
 - 2) 2-7
 - 3) >7
 - 4) No_____
- Ownership of small livestock (sheep and goat) Yes _____if yes
 - 1) < 2
 - 2) 2-7
 - 3) >7
 - 4) No_____
-
- Sufficient crop production for the year
 - 1) Yes_____ if yes how many quintals_____
 - 2) No_____
- Annual farm income
 - 1) No income_____
 - 2) 500-1000 birr _____
 - 3) 1001-2000 birr_____
 - 4) >2000 birr_____
- Average monthly off farm income
 - 1) No income_____
 - 2) 500-1000 birr _____
 - 3) 1001-2000 birr_____
 - 4) >2000 birr_____
- Have you received any food aid in the past 12 months
 - 1) Yes_____
 - 2) No_____
-
- Have your received any remittance in the past 12 months
 - 1) Yes_____
 - 2) No_____

- Do any of your household members have been skill in the past 6 months?

1) Yes_____

2) No_____

3. Household access to food and food supply adequacy

No	Question	Response Options	CODE
1.	In the past four weeks, did you worry that your household would not have enough food?	0 = No (skip to Q2) 1=Yes	 __
1.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) = Often (more than ten times in the past four 3 weeks)	 __
2.	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	0 = No (skip to Q3) 1=Yes	 __
2.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) = Often (more than ten times in the past four 3 weeks)	 __
3.	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	0 = No (skip to Q4) 1 = Yes	 __
		1 = Rarely (once or twice in the past four weeks)	

3.a	How often did this happen?	2 = Sometimes (three to ten times in the past four weeks) = Often (more than ten times in the past four 3 weeks)	 __
4.	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	0 = No (skip to Q5) 1 = Yes	 __
4.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) = Often (more than ten times in the past four 3 weeks)	 __
5.	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	0 = No (skip to Q6) 1 = Yes	 __
5.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) = Often (more than ten times in the past four 3 weeks)	 __
6.	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	0 = No (skip to Q7) 1 = Yes	 __

6.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) = Often (more than ten times in the past four 3 weeks)	 __
7.	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	0 = No (skip to Q8) 1 = Yes	 __
7.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) = Often (more than ten times in the past four 3 weeks)	 __
8.	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	0 = No (skip to Q9) 1 = Yes	 __
8.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) = Often (more than ten times in the past four 3 weeks)	 __
9.	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	0 = No (questionnaire is finished) 1 = Yes	 __

9.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) = Often (more than ten times in the past four weeks)	 _
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4. Copying Strategies

Coping Strategies Index: (In the past 7 days, how many days has your household had to...)	Frequency: Number of days out of the past seven days: (0-7)
a. Borrow or receive food from friends or relatives	
b. Go whole days without eating	
c. Limit portion sizes for all household members	
d. Send children to eat elsewhere	
e. Send women and/or children to work for food	
f. Limit portion sizes and meals for adults in order for small children to eat	
g. Rely on less preferred and less expensive foods	
h. Purchase food on credit	
i. Reduce the number of meals eaten in a day for all household member	
j. Sale household asset to purchase food	

B. Focused Group Discussion (FGD) Questions

1. what are the estimated number of a household
2. what are the main staple food consumed in the area/community
3. what are the main staples food consumed in your household
4. on average how many meal consumed your HH in a day
5. have this number changed since you start living in semi-urban context
6. what are the 3 main sources of food
 - own production
 - labour work
 - off-farm activities

-  gift from friend/relative
-  purchase from market
-  food aid/assistance

7. what are the main sources of income of the household
8. what are the major factor affecting food security of the community

C. Key Informant Interview (KII) Questions

1. Do you think peri-urban female headed households have problem with food security?
What is the extent of the problem?
2. Why do you think peri-urban female headed households food security is a problem?
3. How do peri-urban female headed households cope with the problem of food security?
4. How do peri-urban female headed households address food insecurity? What resources are in place to avoid the problem?
5. What else could be done to improve the peri-urban female headed household's problems with food insecurity?
6. Who are the key players to improve the peri-urban female headed household's food insecurity?