


# WOLDIA UNIVERSITY

## SCHOOL OF GRADUATE STUDIES

**DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES**

**THE CONTRIBUTION OF SMALLHOLDER ONION PRODUCTION TO HOUSEHOLD FOOD SECURITY: A CASE STUDY OF KOBO TOWN, AMHARA, ETHIOPIA.**

**A thesis submitted to the School of Graduates Studies of Woldia University in Partial Fulfillment of the Requirements for the Degree of Master Specialization in Food Security and Development Studies.**

**MA THESIS**

**BY**

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**WOLDIA, ETHIOPA**

# APPROVAL

The undersigned certify that they have read and here by recommend to Woldia University to accept the thesis submitted by Tsehayu Gashaye and the contribution of smallholder onion production to household food security: a case study of kobo town, Amhara, Ethiopia.

In Partial Fulfillment of the Requirements for the Degree of Master Specialization in Food Security and Development Studies.

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## Declaration

This thesis is my original work and has not been presented for a degree in any other university, and that all sources of material used for the thesis have been duly acknowledged.

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# ABSTRACT

*Agriculture plays a vital role in Ethiopia's economy, contributing significantly to foreign exchange earnings and supporting domestic consumption. The main objective of this study is to evaluate the contribution of smallholder onion production to household food security in Kobo Town using a cross-sectional survey data. Multi-stage sampling procedure was used to select 110 sample households. Primary data were collected from household survey, focus group discussion and key informant interview. Different documents were used to collect secondary data. Descriptive statistics like mean, percentage distribution and inferential statistics like, t-test, chi $^2$ to analyze data. The results showed that households engaged in onion production were generally more likelihood of being food secured compared to non-producing households. Onion farming significantly increased household income, created employment opportunities, and facilitated asset accumulation. Income from onion sales also helped households meet essential needs of food and non-food expenses such as education fee, healthcare, and ceremonial expenses. Food security was measured using one of a commonly known measurement of food security status known as food consumption score. There was a significant food consumption difference between onion producer and non-producer sample households at 10 % chi square significant level. So, onion producer households were more food secured than non-producer households in the study area. The study identified several opportunities for enhancing onion production, including the availability of water and land resources, existing irrigation schemes, well-organized farmer cooperatives, infrastructure development, and rising market demand. However, key challenges were also highlighted, including internal conflict, limited access to quality seeds, price fluctuations, disease outbreaks, and credit shortages. To fully realize the potential of onion production, the study recommends addressing these challenges through continuous monitoring, adapting crop calendars, improving access to modern agricultural inputs, and enhancing market and credit services. Implementing these recommendations could substantially boost onion production and improve the status of household food security farmers in the study area.*



***Key words: Food Security, Household Food Security, Contribution, Onion Production, Kobo Town, Ethiopia.***

# ABBREVIATIONS

| | |
|---|---|
| AE | Adult equivalent |
| CSA | Central Statistical Agency |
| DA | Development Agent |
| FAO | Food and Agriculture Organization |
| FAOSTAT | Food and Agriculture Organization Statistics |
| FDRE | Federal Democratic Republic of Ethiopia |
| FGD | Focused Group Discussion |
| Ha | Hectare |
| HDDS | Household Dietary Diversity Score |
| HHs | Households |
| KII | key informant interview |
| MoFED | Ministry of finance and economic development |
| PASDEP | Plan for accelerated and sustained development to end poverty |
| SPSS | Statistical Product Service Solutions |
| USAID | United States Aid for International Development |
| WFP | World Food Program |
| IFAD | International Fund for Agricultural Development |
| IFPRI | International Food Policy Research Institute |
| Kcal | Kilocalorie |
| Kg | Kilogram |

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# CHAPTER ONE
# INTRODUCTION

## 1.1 Background of the Study

Onion (*Allium cepa* L.) is among the most widely consumed vegetables worldwide and is typically a cool-season crop, although it can be grown in various climatic conditions. In Ethiopia, onions are primarily cultivated for their bulbs, which are a staple in everyday cooking (Getu & Ibrahim, 2018).

The sensitivity of onions today length leads to the existence of different varieties based on the latitude where they are grown. Globally, onions are cultivated on over 3.6 million hectares, with an annual production of approximately 80 million metric tons. China stands as the largest producer, accounting for about 28% of the global onion supply, followed by countries like India, the USA, Iran, and Egypt. In terms of exports, the Netherlands leads with about 220,000 metric tons, followed by India (FAOSTAT, 2014).

Ethiopia has a significant potential to produce onions throughout the year, not only for domestic consumption but also for export. Since its introduction to different regions of the country, onion cultivation has become an important income source for many farmers, contributing to the commercialization of the rural economy and creating numerous off-farm employment opportunities (Alemu et al., 2022).

From 2000 to 2011, Ethiopia, which is the third-largest onion producer in Africa after Egypt and South Africa, contributed a modest 2.7% to global onion production (FAOSTAT and FAO, 2019). However, between 2010 and 2018, the national average for onion cultivation 28,942 hectares, 33,947 tons of production, and a yield of 11.70 tons/ha was well below the global average of 19.7 tons/ha (Habtamu Gudisa Megersa, 2017).

Onions are increasingly recognized in Ethiopia for their role in human nutrition, particularly as a source of antioxidants like vitamins A, C, and E, which are known to neutralize free radicals associated with cancer, cataracts, heart disease, hypertension, stroke, and diabetes. Public health initiatives have raised awareness of the nutritional and health benefits of vegetables, including onions, in recent years (Tabor & Yesuf, 2012). Furthermore, onions contribute significantly to farm incomes, poverty reduction, and foreign currency earnings through export and foreign direct investment (Nigatu, 2016).

Onion cultivation is widespread in central, northern, and eastern Ethiopia, with the study area being one of the potential districts for onion production. The region's high irrigation potential allows farmers to grow various vegetables, with onions being a major cash crop.

Both smallholder and large-scale farmers primarily cultivate onions for the market. Given the importance of onions as a cash crop in Ethiopia, contributing significantly to the daily diet and livelihoods, this paper aims to assess the impact of onion production on household food security in Kobo town administration, North Wollo, Amhara, Ethiopia.

## 1.2 Statement of the problem

The agricultural sector is a cornerstone of Ethiopia's economy, accounting for 36% of the GDP, 80% of export earnings, and employing around 70% of the population (MOFEC, 2018). Despite its critical role, the sector is still dominated by rain-fed subsistence farming, with smallholders typically cultivating less than a hectare of land. The development of agriculture in Ethiopia has been impeded by various challenges, including soil erosion, limited access to agricultural inputs, weak organizational structures, and ineffective agricultural policies and strategies (Hailu, 2016).

Transforming subsistence farming into a prosperous and commercialized sector has long been identified as a key development goal, as highlighted in the Plan for Accelerated and Sustained Development to End Poverty (PASDEP, 2005). However, recent studies indicate that there is little evidence of significant progress in transitioning small-scale agriculture to a commercial scale in Ethiopia. According to Geta and Kifle, 2011 cash crops like vegetables face several constraints, including a lack of credit facilities, inadequate marketing infrastructure, and limited access to improved technologies and inputs. Government policies tend to emphasize the commercialization of commodities with export potential and high growth impact. However, there is a compelling argument that household-level production of cash crops, particularly onion, can enhance food security by improving nutritional value and increasing the income of producers.

In Ethiopia, research has predominantly focused on major cash crops such as coffee, chat, and spices. These crops have received substantial government support and promotion, with studies mainly addressing production and marketing constraints, as well as their impact on livelihood security. Although there are detailed reports on crops like sweet potatoes and ginger (Geta and Kifle, 2011), research on onions, particularly their contribution to household food security in the study area, is limited.

This study aims to fill this research gap by exploring the potential of onion production in the area. It also seeks to identify key opportunities and constraints related to onion cultivation,

thereby enhancing our understanding of its contribution in improving household food security. This study aims to fill this research gap by exploring the potential of onion production in the area. It also seeks to identify key opportunities and constraints related to onion cultivation, thereby enhancing our understanding of its contribution in improving household food security.

## 1.3. Objective of the Study

### 1.3.1. General Objective

- To assess the contribution of smallholder onion production to Household food Security.

### 1.3.2 Specific Objectives

- To examine the status and contribution of onion production to Household food Security.
- To identify Major opportunities for onion production in the study area
- To show the constraints of onion production in the study area.

## 1.4. Research Questions

1. What is the contribution of onion production to household food security in the study area?
2. What are the major opportunities for onion production in the study area?
3. What are the constraints of onion production in the study area?

## 1.5 Significance of the Study

This study examines the contribution of smallholder onion production on household food security, with findings that are expected to be applicable to other regions within North Wollo Zone and areas with similar agro-ecological and socio-economic conditions. The research also serves as a valuable reference for other researchers conducting studies on related topics. Additionally, the results provide valuable insights for local communities, institutions, government agencies, and NGOs seeking to enhance income from onion production to support both food and non-food expenditures.

## 1.6 Delimitation of the Study

This study was conducted in the scope of Kobo Town administration, selected one rural Kebele and 110 sample farmer households. That is onion producers and non-producers.

The specific objective of this study was to examine the status and contribution of onion production to Household food Security, to identify Major opportunities for onion production and to show the constraints of onion production by using a cross-sectional survey data from respondents were collected the data since July, 2022 until June, 2023 cropping year /one year/. But, the survey were collected and analyzed on 2024.

## 1.6. Limitation of the Study

A significant challenge faced was the lack of a direct, comprehensive measure of household food security. The indirect measures currently available are methodologically inadequate and not standardized, complicating data comparison.

The study exclusively examines how smallholder onion production contributes household food security. It measures food security using food consumption score thresholds but does not explore food distribution within households or access to nutritious food for all household members.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1. Operational Definitions and Concepts

### 2.1.3 Definitions and Concepts of Food Security

***Food Security***

In the mid-1970s, concerns about food security were primarily focused on national and global food supplies. By the 1980s, attention shifted towards addressing the disparity between the rich and poor, leading to increased pressure to ensure food access at the household and individual levels (S. Maxwell & Frankenberger, 1992).

**Food security** is a concept with numerous definitions; a recent review identified around 200 different descriptions (Hoddinott, 2001). The most widely accepted definition is that food security exists when all individuals consistently have physical and financial access to sufficient food to meet their dietary needs for a healthy and active life (Teklie, 2013).

Food security is a complex concept shaped by various agro-ecological, social, and economic factors, making it difficult to measure with a single metric. Instead, food security is typically assessed through three distinct dimensions: food availability, access, and utilization. Additionally, the stability of these dimensions is crucial for a comprehensive understanding of food security (Jrad, Nahas, & Baghasa, 2010). The author explained the four main determinants of food security:

**Food availability:** ensures that all citizens have consistent access to sufficient food, which can be supplied through domestic production, commercial imports, or existing food sources. Food access: refers to the ability of households to obtain adequate food that is both nutritious and sufficient in quantity. This involves having food available at the right time and place, and individuals must possess the financial means or purchasing power to acquire this food. Food utilization: involves the proper use of food to meet biological needs, which requires a diet rich in energy and essential nutrients, along with access to clean water and sanitation.

**Food stability:** pertains to the reliable availability of enough food throughout the entire year, without interruptions. To ensure food security, it is essential that populations, households, or individuals consistently have access to adequate food. They should not face hunger due to sudden disruptions, such as economic or environmental crises, or seasonal fluctuations. Consequently, "stability" is a crucial component when considering both food availability and access(Jrad et al., 2010).

**Household Food Security:** The FAO (1997), as cited by Tiago S. Wandschneider (1999), defines food security as a situation where everyone consistently has physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and preferences for a healthy and active life. This definition emphasizes two crucial factors: ensuring adequate food availability through domestic production, storage, or imports, and the ability to acquire enough food through means such as subsistence farming, market purchases, or food transfers. It also underscores the need to assess food security at the individual, household, or vulnerable group level.

**Food consumption score:** This measure assesses whether household members consumed items from various food groups over the past week. These groups include cereals, white roots and tubers, vegetables, fruits, meat and poultry, eggs, fish and seafood, pulses, nuts, seeds, milk products, oils and fats, sweets, and spices (Sileshi, Sieber, Lejissa, and Ndyetabula, 2023). Developed by the World Food Programme (WFP) in 2008, the Household Food Consumption Score (HFCS) provides a snapshot of food security based on dietary diversity and frequency(WFP, 2008).

**Income:** Refers to the total money earned in exchange for labor, including payments for goods, services, and capital gains. It includes both farm and non-farm/off-farm income received over a specific period (Nobes, 2012).

### 2.1.2 Household food security

Studies on the assessment of food security can take a different level of the unit of analysis, at national, regional, community, household, and individual levels. Since collecting precise information for each individual might be impossible or too costly, especially in poor countries like Ethiopia, there is an option that is widely practiced in food security research.

This study starts at household level analysis by applying food consumption score was selected to estimate the FCS and foods was regrouped into eight standard food groups.

The Food Consumption Score (FCS), a tool developed by WFP, is commonly used as a proxy indicator for access to food. It is a weighted score based on food frequency and the nutritional importance of food groups consumed. Data was collected on the number of days in the week a household ate specific food items. It is a weighted score based on food frequency and the nutritional importance of food groups consumed.

The Household food consumption score (FCS) was calculated by multiplying each food group frequency by each food group weight, and then summing these scores into one composite score.

The weighting of food groups has been determined by (WFP, 2008), according to the nutrition density of the food group. In line with the explanations given above, the most basic estimation equation for the Food Consumption Score used for this study is: FCS=$a \times f$(staple)+β×$f$(pulse)+γ×$f$(vegetables)+γ×$f$(fruit)+$\delta$×f(animal)+$\varepsilon \times f$(sugar)+$\delta \times f$(dairy)+$\varepsilon \times f$(oil)

Where:

FCS = food consumption score,

$f$= frequencies of food consumption = number of days for which each food group was consumed during the past 7 days,

$a$, β, γ, $\delta$ and $\varepsilon$ = weight/nutritional value of each food group.

According to (WFP, 2008), the FCS is interpreted as follows: a score between 0 and 28 indicates poor food consumption, a score between 28.5 and 42 denotes borderline food security, and a score above 42 reflects adequate food consumption. This classification allows for an evaluation of household food security levels. Therefore, this study focuses on household level but not focus on national or individual level.

## 2.2 Farmer`s Onion Production Practices in Ethiopia

Onions are a key ingredient in Ethiopian cuisine (Etana, Aga, & Fufa, 2019)and are primarily grown in the highlands and mid-altitude areas by smallholder farmers. The main onion-producing regions in Ethiopia are Amhara, Tigray, Oromia, Benishangul- Gumuz, Gambela, and the South Nations, Nationalities, and Peoples' Region (CSA, 2013). Commercial onion production is mainly concentrated in the central Rift Valley and around Lake Tana in the Amhara Region, with some production also occurring in Tigray (Etana et al., 2019).This important cash crop helps improve farmers' incomes and is cultivated for both local and regional export markets, including Djibouti, Somalia, and Sudan. In 2011, Ethiopia exported 13,957 tons of onions and cut flowers, generating approximately 2.98 million USD in revenue (FAOSTAT, 2014)

Onions, which are predominantly grown during the dry season, require regular irrigation to thrive. Farmers typically irrigate their fields every 15 days, but this schedule often disregards the plant's developmental stages, leading to potential issues such as water stress or overwatering, which can reduce yields. The recommended irrigation frequency for onions is twice a week for the first three weeks after transplanting, and then every 5-7 days thereafter, depending on soil type and weather conditions.

Common irrigation methods include furrow and flood irrigation (Desalegne & Aklilu, 2003). Water sources for irrigation include rivers, lakes, natural springs, and streams. Many onion growers use water pumps to extract water from these sources, while others channel water directly to their fields.

In Ethiopia, the favorable tropical climate promotes the development of pests, which significantly affects onion crops across the country, including in the study area. The prevalence and severity of these pests are exacerbated by improper agronomic practices employed by smallholder farmers. Additionally, many onion growers do not apply the correct pesticides or adhere to recommended application rates, leading to further losses. Common diseases affecting onions in Ethiopia include purple blotch, onion neck rot, and powdery mildew, which are caused by the fungi *Alternaria porri*, *Botrytis cineraria*, and *Peronospora destructor*, respectively (Desalegne & Aklilu, 2003). Among insect pests, trips, mites, and cutworms are the most significant threats to onion farms managed by farmers(Dessalegn and Aklilu, 2003).

Farmers typically harvest their onions manually by pulling up the tops of the plants once 70-80% of the plants have bent near the ground. Many farmers do not practice curing or drying after harvest, which shortens the shelf life of the onions and increases postharvest losses. Instead of storing the onions for an extended period, farmers often sell their produce immediately at prevailing market prices, which are generally low during the main growing season (Zeleke et al., 2021). Overall, onion production and productivity among farmers are lower than their potential. This is likely due to a combination of factors, including improper agronomic practices, a shortage of improved onion varieties, prevalent diseases and insect pests, and inadequate extension services (Zeleke et al., 2021).

## 2.3 Potentials and Constraints of Onion Production in Ethiopia

Ethiopia including the Amhara Region, benefits from a range of agro-ecological zones due to its varied altitudes, allowing for the year-round cultivation of tropical, subtropical, and temperate vegetables, including onions. The region is also rich in both underground and surface water resources, which can support the production of horticultural crops such as onions (Awulachew, 2019).Additionally, the extensive areas of arable land and fertile soils in Ethiopia enhance its suitability for large-scale onion production (Joosten, Boselie, Wolde, and Desalegn, 2011).

The cultivation of horticultural crops, particularly onions, is a labor-intensive activity (Bogale, 2017).

In the Amhara Region, over 50% of the population is of working age and can be actively involved in onion production. The growing demand in export markets presents a significant opportunity for Ethiopian farmers, including those in Amhara, to produce high-quality onions for export, given Ethiopia's proximity to global markets compared to other exporters (Joosten et al., 2011).Furthermore, the Ethiopian government is dedicated to advancing the horticulture sector by developing irrigation schemes to support year-round vegetable production, including onions, as outlined in its first Growth and Transformation Plan (2010-2015) (Ashinie and Tefera, 2019). In this context, both the federal and regional governments are investing in large, medium, and small-scale irrigation projects to boost the production of fruits, vegetables, and other cash crops, thereby improving the livelihoods of smallholder farmers (Joosten et al., 2011).

In addition, the government is committed to fostering private investment in the horticulture sector by offering various incentives. These include duty-free imports, income tax exemptions, loss carry-forward provisions, remittance of funds, and investment guarantees and protections (Bogale, 2017).

Despite their significant potential, the production and productivity of horticultural crops, including onions, in Ethiopia—particularly in the Amhara Region—remain quite low. This is largely due to reliance on smallholder farming practices, which often involve inappropriate agronomic methods, insufficient use of agricultural inputs such as fertilizers, improved varieties, and pesticides, and poor postharvest handling. Farmers generally use traditional farming techniques, leading to suboptimal production outcomes (Ashinie and Tefera, 2019). Additionally, the production of horticultural crops is heavily reliant on natural rainfall, making it vulnerable to fluctuations in weather patterns. Onion farming, like other horticultural practices, relies on outdated methods and lacks access to improved production technologies. The scarcity of high-quality onion seeds is due to an underdeveloped seed production system in the region. Moreover, while fertilizers are available for major crops, their supply for irrigated vegetables like onions is inadequate (Ashinie and Tefera, 2019).

Diseases and insect pests also pose significant challenges to onion production in Ethiopia, including in the Amhara Region. Many farmers either do not use pesticides or face issues with the availability of these chemicals. Additionally, some traders adulterate pesticides by mixing them with other substances, which can diminish their effectiveness or even harm the crops. This not only exacerbates pest problems but also leads to economic losses for onion growers (Edossa Etissa, 2013).

Poor infrastructure, including inadequate rural roads and limited communication systems, hampers the efficient movement of goods and market information. Many production sites are inaccessible to vehicles, and the handling and transportation facilities are rudimentary. Onions, being highly perishable, require proper handling to prevent quality deterioration and cannot be stored for long periods. These challenges severely impact the marketing of horticultural crops, including onions, negatively affecting farmers' income and diminishing their motivation to engage in onion production in subsequent years (Ashinie and Tefera, 2019).

## 2.4. Distribution and Importance of Onion

Onions are among the oldest cultivated vegetable crops and are now grown in at least 170 countries worldwide (FAOSTAT, 2014). In 2014, global onion production reached 85,944,419 million tons per hectare. China and India are the top producers, with harvested areas of 1,025,000 and 1,203,565 million hectares, respectively (FAOSTAT, 2014).

China accounted for 26.3% of global onion production, while India contributed 22.6%. In terms of productivity, the USA leads with 54.6 tons per hectare, followed by the Netherlands with 49.7 tons per hectare, Egypt with 33.7 tons per hectare, and Iran (FAOSTAT, 2014).

Onions are grown in various regions of Ethiopia, including Awash Valley, the Lake Region, and around Lake Tana in the Amhara Region. These areas are significant for the production of dry bulbs and seeds, with contributions from smallholder farmers, private commercial growers, and state enterprises (Desalegn and Aklilu, 2003). According to recent data from the Central Statistical Agency (CSA, 2013), Ethiopia's onion production is approximately 230,745.2 tons with a productivity of 10.1 tons per hectare.

During the same production season, about 705,877 households were involved in onion cultivation. As a key cash crop for small-scale farmers, onions play a crucial role in boosting income and improving livelihoods. The expansion of irrigable areas in Ethiopia is expected to further increase onion production in the near future(Dessalegn and Aklilu, 2003).

## 2.5. Conceptual framework

The conceptual framework depicted in Figure 1 is grounded in literature and empirical evidence, illustrating the relationships between key variables in the study. It highlights how these variables are interconnected and how to affect household food security.

The analytical frame work shows that the linkage between household food security and variables assume that affect household food security in the study area. Based on the nature, these variables are classified under three categories.

These are demographic factors under these categories which include family size, age of households, marital status, sex of households and educational status of households.

Socio-economic factors includes, farm Land holding size, ox ownership, and off-farm activity.

Institutional factors which include credit use, access to extension service access to market information, and access to irrigation.

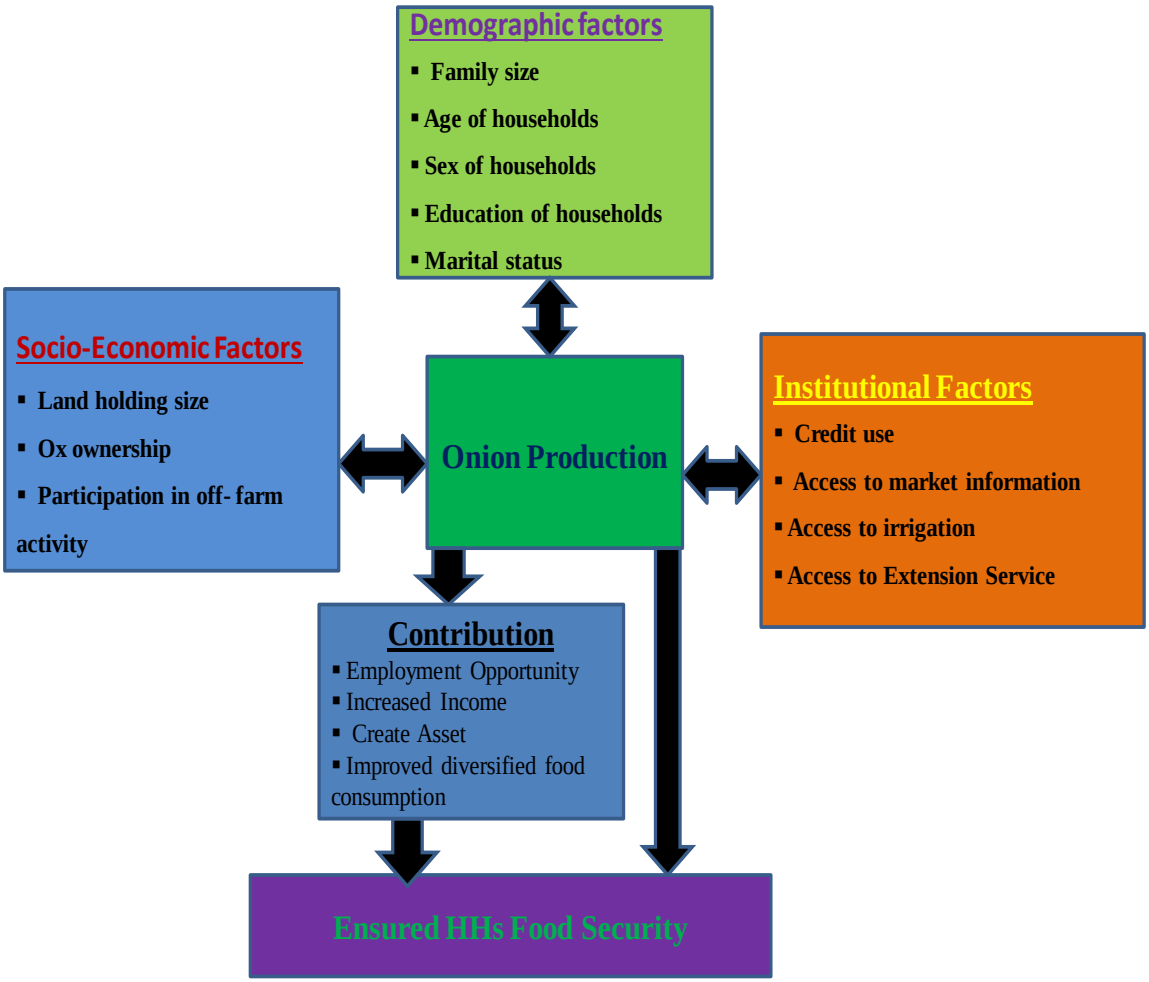



Figure 1 Conceptual framework for contribution of onion Production to Household food Security.

Source: Adapted from Conventional Food Security Conceptual framework (World Bank, 1999).

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1. Description of the Study Area

The study area is Kobo Town, situated in the Surrounding District of the North Wollo Zone in the Amhara National Regional State of Ethiopia. It lies approximately 570 km north of Addis Ababa, 382 km northeast of Bahir Dar (the capital of the Amhara National Regional State), and 50 km north of Woldia Town. Geographically, Kobo Town is located between 11°54'04" and 12°20'56" N latitude and 39°25'56" and 39°49'04" E longitude, with an average altitude of 1,500 meters above sea level.

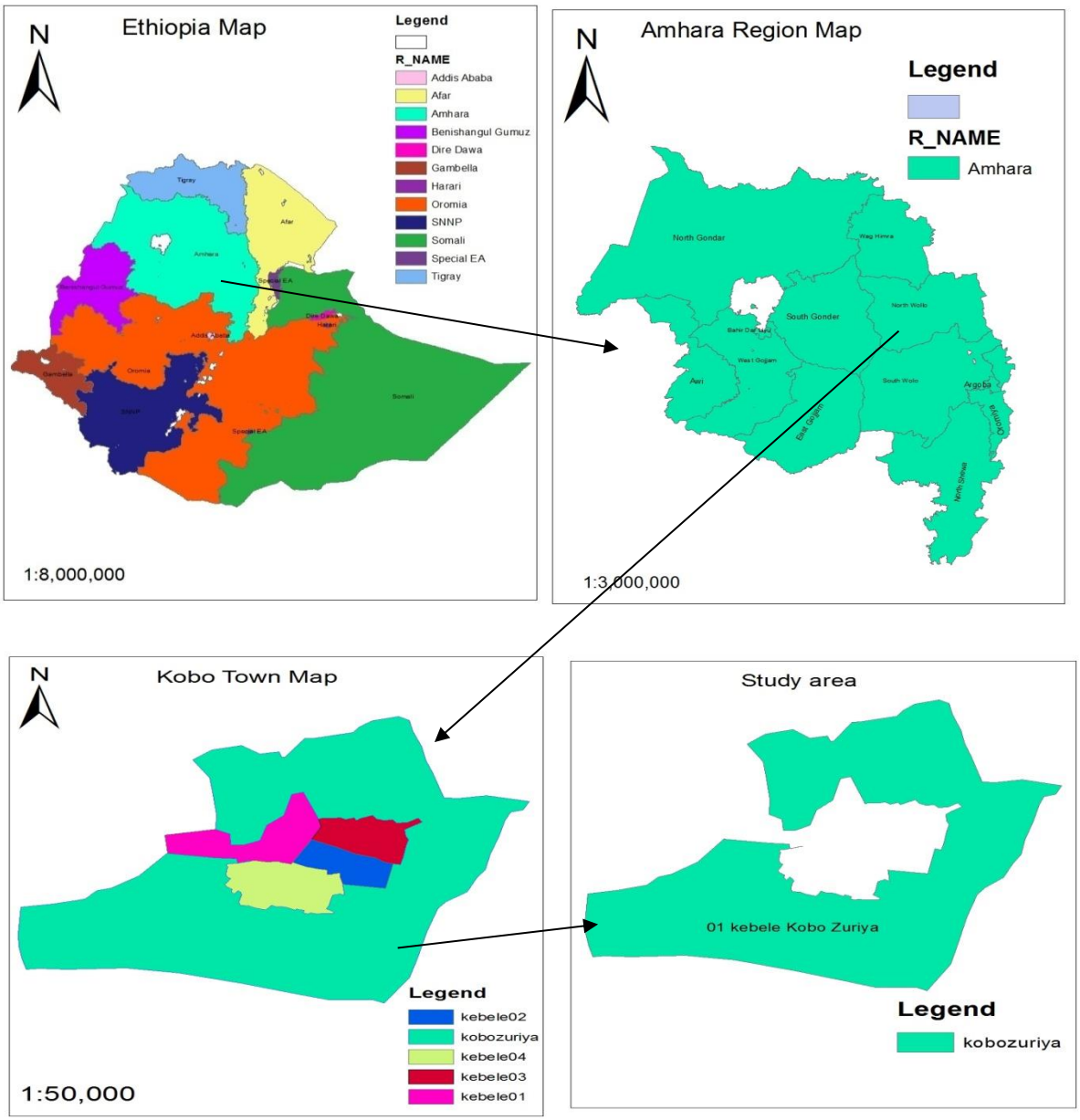
The town enjoys favorable climatic conditions with an average annual rainfall of 800 mm and an average temperature of 22°C. According to the Kobo Town Administration Office report for 2022/23, the town has a total population of 85,073, including 41,425 males and 43,648 females. The total number of households in the town is 17,500, with 14,500 male-headed and 3,000 female-headed households. Kobo Town functions as the capital city of Raya Kobo Woreda and is administratively divided into four urban kebeles and one rural kebele.

According to Kobo Town Agricultural office report 2022/23, a total land size of the study kebele area is 7,374.10 hectares, with approximately 4,171 hectares cultivated through rain-fed agriculture and 624 hectares through irrigation. The kebele is believed to have significant underground and surface water resources. An economic activity in the study area includes farming, Trade, and wage employment.

According to the Kobo Town Administration Office report for 2022/23, major sources of income for local communities include agriculture (especially the sale of food crops, forest products, livestock, and livestock products). In 01 Kobo-Zurya Kebele, there is substantial potential for irrigation using both surface and ground water.

The primary crops cultivated in the area include cereals such as teff, sorghum, and maize, as well as pulses like chickpeas and fruits such as mangoes and papayas. Animal husbandry is also a key sector, with practices involving cattle, camels, and goats. Recently, some farmers have diversified their farming systems by incorporating cash crops like onions, peppers, and tomatoes, utilizing available water resources. This study specifically focuses on onion production, as it is a significant crop for many farmers in the area compared to other vegetables.

Figure 2 Map of the Study Area




Source: By Researcher, December, 2023

## 3.2. Research Design

The general objective of this study was to evaluate the contribution of smallholder onion production to household food security in Kobo Town, Amhara National Regional State, Ethiopia. To achieve this, cross-sectional data was collected from a sample of households at a single point in time. Unlike longitudinal data, which is collected over a period, cross-sectional data provides a snapshot that allows for quick identification of potential differences between groups. It was used to describe the contribution of onion production for HHs food security, major opportunities and challenges of onion production, and to indicate potential solutions and recommendations of onion production to ensure household food security in the study area and used quantitative and qualitative methods to meet these objectives.

## 3.3. Data types and sources

The study was used both primary and secondary data sources. Primary data were collected directly from onion producers and non-producers of selected kebele on the way of questioners. Quantitative and qualitative data were applied by administering structured, semi-structured, and open ended focused questionnaires from 110 sample household survey, KIIs, and FGD respondents.

The quantitative data were used to assess demographic, socio-economic characteristics, and institutional aspect, contribution of onion production to household food security status.

Qualitative method was used to capture data on major opportunities and constraints for onion production. This was applying by using interviews in one purposely selected Kebele (01 Kobo-zurya). Secondary data were reviewed and consolidated from different documents both published and unpublished materials, which were necessary for this study.

## 3.4. Methods of data collection techniques

The research was based on both qualitative and quantitative data and collected using the following data-collection instruments.

Household surveys, key informant interviews (KIIs), and Focused group discussions (FGDs) were employed to collect data. The semi-structured interview schedule for the household survey was initially developed in English and then translated into Amharic to help with the interview procedure. The interview schedule was tested at the local level before it was used to collect the data. FGD and KII were employed for gathering qualitative data from the sample respondents. FGD guide and KII checklist were developed for gathering data from the sample respondents.

**Household Interview Schedule:** Based on related kinds of literature and investigators' knowledge, semi-structured survey questions were constructed to collect data from sampled HHs. A 7days (week) dietary recall survey was undertaken to acquire food category information for the households' food intake by targeting the respondents' dietary information. The respondents were asked to recall all food items taken or consumed and beverages took in 7days before the interview. The household interview schedules comprise of household's demographic, socioeconomic characteristics, institutional factors, and other issues related to contribution of smallholder onion production to household food security in the study area.

**Three enumerators,** all them qualified with first degree, were selected and recruited based on their adequate knowledge about the area, prior exposure to agriculture and food security related works, and well acquainted with the culture, norm, and Amharic language of the study area. The appropriate and significant training of enumerators was carried out about food consumption score questions; data collection procedures and the content of the interview schedule for one day to minimize relatively complexity of surveys errors in data collection. Before official implementation, the survey questions were pre-tested on 6 (5% (n=110)) the approximate of 6 farmers of sample kebeles as a pilot study in the district. In doing so, ambiguous questions were omitted and replaced by valued questions.

**Key Informant Interviews (KIIs):** to get deep and diverse qualitative data on opportunities and constraints for onion production. A total of 6 KIIs were conducted with key informants at different levels, ranging from community to district levels. The key informants were knowledgeable and experienced community members by community leader's consultation. Similarly, 1development agent (DA), 1 health extension worker, and 1male from irrigation cooperative were selected from sample kebele, and experts from Kobo-Girana horticulturist (1), from food security office (1), and from trade office(1) were selected at the district level.

The key informants were purposively for their onion production and food security knowledge and skills as well as involvement in support provisions to onion farmers. Onion production and its contribution to household food security and other data related to the study subject were collected. Thus, the data was used to enrich information gained from the household survey and FGDs.

The KII was used to identify and refine the list of food items that are consumed by rural households. This information assisted in organizing food groups and conducts the survey to collect the food consumption of the sample households. The KIIs investigate different food types that were consumed by producers and non-producers in the area. Participants in the KII

were also asked to identify the constraints and opportunities of onion production in the study area for dietary improvement.

**Focused Group Discussions (FGDs):** Focused group discussions are sources of qualitative data, which are used to support and cross-examine information obtained from the survey respondents about the contribution, opportunities, and constraints of onion production and were used to triangulate the information generated from the structured interview method and KIIs. The number of FGD participants was determined based on Hennink's recommendation, as cited by Wondimneh (2014), that a group of 6-8 participants should be used for easy management, smooth interaction, and rich details, and equitable opportunity to give insights. Therefore, 1 FGDs were undertaken in one selected kebele consisting of 6 discussants per group; they were from non-sample households but, well aware of the local setting. The discussants were selected purposively by the consultation of informed local elders; and based on gender, education level, and wealth status to have a broader viewpoint from the diverse social segments.

Furthermore, the researcher is aware of including old, middle, and young farmers to get a diverse age spectrum. The participants of the focus groups for 1 kebele' were heterogeneous, composed of HHs; youth, old people, and religious leaders from kebele leaders, farmers, DAs and health Experts. Contribution of onion production, food consumption, major opportunities and constraints, sources of food, landholding situation, access to extension service, and farming employment (non/off-farming activities) were all discussed during the interactive discussion. In all FGDs, the researcher played an active role in organizing, moderating, and facilitating the whole discussion process.

The qualitative data about the contribution of smallholder onion production to HHs food security in kobo town district, as well as other facts pertinent to the study, were collected from FGD discussants. FGD was conducted by the researcher who served as a moderator, facilitator and note-taker. All FGDs and KIIs information were noted on the notebook with the permission of discussants and/or respondents to write out notes and were translated into the English language.

## 3.5. Sampling Procedure and Sample Size

In this study, a multi-stage sampling method was employed to select the samples. Firstly, Kobo Town in the North Wollo Zone was purposefully chosen due to its potential for onion production and its significant role in supplying major onion market centers in the Zone. And then, Kobo Town consists of four urban kebeles and one rural kebele. From these, 01 Kobo-Zurya kebele, known for its potential in onion production, was purposively selected.

In the second stage of the sampling procedure, the sample households were divided into two groups, onion producers and non-producers. This was to ensure comparative analysis between these two groups of households.

Then in consultation with Kobo Town agriculture office experts, thirdly, by using simple random sampling technique (lottery method) was applied by taking into account probability proportional to size of the identified households (based on DAs registered list of producers and non-producers) in the selected kebele after determination of sample size.

According to research conducted by Getu Gemechu (2011) as used the number of sample non-producer's households drawn from each kebele was determined in proportion to the number of vegetable producing households in each kebele. The proportion is 1:5 which means one non-producer to five producers sample households. Having this in mind, this research also used the same procedure.

According to the Kobo Town Agricultural Office 2022/23 data, there are 1,264 onion-producing households in 01 kobo-zurya kebele.

Finally, Using Yamane's (1967) formula with a 90% confidence level and a 10% sampling error, 92 onion-producing households were randomly selected from the list of producers (by lottery method). The sample households were divided into two groups: onion producers and non-producers. For comparison purposes, 18 non-producers were deliberately chosen, representing one-fifth of the producers, to facilitate a comparative analysis between these two groups.

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

Where

n = total sample size of this study

N= total onion producer households of the selected kebele, 1264

e = error (above 90% level of confidence) the confidence level of this research is 90%. So, 110 households are the sample size.

e = sample error $(0.1)^2$.

n = $1264/1+1264(0.1)^2$ = **92**

Then, to select non- producers = 1/5*producers, 1/5*92=18 non-producers selected by using simple random sampling method.

Totally, 110 households (92 producers and 18 non-producers) were selected using random sampling from the list, and the proportion of producers and non-producers are 84% to 16%, respectively.

## 3.6. Household food security

### 3. 6.1. Food consumption score

This was important for categorized household food security status of onion producers and non-producers to be food secured or in secured at household level. There are many household food security indicators from these food consumption score was selected to estimate the FCS and foods was regrouped into eight standard food groups.

The Food Consumption Score (FCS), a tool developed by WFP, is commonly used as a proxy indicator for access to food.

It is a weighted score based on food frequency and the nutritional importance of food groups consumed. Data was collected on the number of days in the week a household ate specific food items. It is a weighted score based on food frequency and the nutritional importance of food groups consumed.

3. 1 Food items, food groups and weights for calculation (FCS)

| S/N | Food items | Food group | Weight |
|---|---|---|---|
| 1 | Cereals: Corn, Wheat, Sorghum, Rice, Bread Roots and Tubers: | Staples | 2 |
| 2 | Pulses/Beans/ Nuts Pulses | Pulse | 3 |
| 3 | Milk/ Milk Products Milk | Milk | 4 |
| 4 | Animal Proteins: Fish, Meat, Eggs | Meat and Fish | 4 |
| 5 | Vegetables (including green, leafy vegetables) | Vegetables | 1 |
| 6 | Sugar/ Honey | Sugar | 0.5 |
| 7 | Fruits | Fruits | 1 |
| 8 | Oil and Fats | Oil | 0.5 |

Source: World Food Program, 2008

The Household food consumption score (FCS) was calculated by multiplying each food group frequency by each food group weight, and then summing these scores into one composite score. The weighting of food groups has been determined by(WFP, 2008), the most basic estimation equation for the Food Consumption Score used for this study is:

FCS=$a\times f$(staple)+β×$f$(pulse)+γ×$f$(vegetables)+γ×$f$(fruit)+$\delta$×f(animal)+$\varepsilon\times f$(sugar)+$\delta\times f$(dairy) +$\varepsilon\times f$(oil)

Where:

FCS = food consumption score,

$f$= frequencies of food consumption = number of days for which each food group was consumed during the past 7 days,

$a$, β, γ, $\delta$ and $\varepsilon$ = weight/nutritional value of each food group.

According to (WFP, 2008), the FCS is interpreted as follows: a score between 0 and 28 indicates poor food consumption, a score between 28.5 and 42 denotes borderline food security, and a score above 42 reflects adequate food consumption. This classification allows for an evaluation of household food security levels. Therefore, this study focuses on household level but not focus on national or individual level.

## 3.7. Method of Data Analysis

After data collection and editing and coding were completed, it was entered into computer using statistical package for social science (SPSS) software. For the purpose of this particular study, the collected data was analyzed in different ways. Based on objectives of the study, both descriptive and inferential statistics were adopted for all objective of the study.

The study employed both quantitative and qualitative methods for data analysis. Quantitative data were processed using SPSS, where descriptive statistical tools such as frequency, percentages, means, standard deviations, and cross-tabulation were applied.

Inferential statistics like chi square was used to identify the associations between categorical variables whereas, independent variables like t- test was used to compare mean differences between two groups across the study variable.

Data that was obtained from key informant discussion, and FGD were analyzed in qualitative ways especially for objective two and three.

## 3.8. Ethical Consideration

It is essential to inform respondents about the study's objectives. Accordingly, the researcher began each interviewee by explaining the purpose of the study and how the data would be used. Respondents were assured that the research was conducted solely for educational purposes, with no direct benefits or risks to them. They were also informed that their responses would be kept confidential and used anonymously.

To ensure transparency and safety during data collection, a letter from a supervisor was provided to relevant authorities, clarifying that the research was for academic purposes. Before the interviews began, respondents were informed that participation was voluntary and that they could withdraw at any time. Consent to participants was requested verbally to each respondent and all of sample respondents were voluntary to conduct the interviewee through verbal consent. Additionally, respondents were guaranteed that their identities would be protected through anonymity, ensuring that individuals reviewing the data would not be able to identify who provided specific responses.

## 3. 9. Validity

Validity is a crucial aspect of data collection. To ensure the accuracy and reliability of the collected data, the research employed multiple methods, including questionnaires, survey interviews, and FGD. Special attention was given to triangulating both qualitative and

quantitative data. Key insights from the qualitative data were cross-verified and integrated with findings from primary and secondary quantitative data to comprehensively address the research questions. Additionally, the studies utilized secondary sources to cross-check and validate the findings against previous research.

# CHAPTER FOUR

# RESULT AND DISCUSSION

This chapter deals with the analysis of the primary and secondary data from both qualitative and quantitative variables. It includes the descriptive analysis of characteristics of total households of onion producers and non-producers of demographic, socio-economic, and institutional factors summarized results using descriptive and inferential statistics. Descriptive statistics such as percentages, mean, standard deviation and frequencies was used to describe the data. Inferential statistics like chi square was used to identify the associations between categorical variables whereas, independent variables like t- test was used to compare mean differences between two groups across the study variable.

This chapter focuses on analyzing and interpreting the survey data. It examines the contributions of smallholder onion production to the food security of sampled households. The analysis utilizes both descriptive and inferential statistics to discuss the findings and their implications.

## 4.1. Demographic Characteristics

### Age of sampled respondents

The survey results indicate that 89.1% of onion-producing household heads fall within the active and productive age group of 18 to 60 years, while 100% of non-producing household heads are also within this age range. This suggests that 90% of both onion producers and non-producers are in the 18-60 age brackets. However, the chi-square test reveals that the difference in age distribution between the two groups is not statistically significant at the 10% confidence level (Table 4. 1).

### Sex of sampled respondents

Among the 92 producing households, 80 (87%) are headed by males, and 12 (13%) are headed by females. In contrast, among the non-producing households, 11 (61%) are headed by males and 7 (39%) by females. However, the chi-square test reveals that the differences in sex between the two groups were statistically significant at the 10% confidence level (Table 4. 1).

This indicates that female-headed households are underrepresented in onion production. According to an expert from the Kobo Girana Valley, this disparity may be attributed to the

labor-intensive nature and high management requirements of onion production, which may exceed the capacity of female-headed households (Table 4.1).

## Marital Status of sampled respondents

Regarding the marital status of household heads, the majority of respondents are married (85%), followed by widowed or widower (10%), divorced (5%), with no single household heads. Among the married households, 89% are involved in onion production, whereas 61% of non-producing households are married. The chi-square test indicates a significant difference at a 10% level of confidence (Table 4.1).

### Educational status of sampled respondents

Education can influence farming households' engagement in cropping activities, potentially due to better access to information and modern farming practices. According to the household survey result, from the total sample households, 55% illiterate, while 45% are literate. Among these, 53% of producing household heads and 67% of non-producing household heads are illiterate. This suggests that a higher illiteracy rate among non-producing households. However, the chi-square test indicates that this difference is not statistically significant at the 10% level of confidence (Table 4.1).

4. 1 Sampled HH s Demographic factors (Age, sex, Marital Status, Educational Status)

| **Demographic factors** | **Producers (N = 92 )** | | **Non- Producer ( N =18 )** | | **Total (N = 110 )** | |
|---|---|---|---|---|---|---|
| Age | N | % | N | % | N | % |
| 18-30 | 8 | 8.6 % | 1 | 5.6 % | 9 | 8 % |
| 31-60 | 74 | 80.5 % | 17 | 94.4 % | 91 | 83 % |
| >61 | 10 | 10.9 % | 0 | 0 % | 10 | 9 % |
| Total | 92 | 100 % | 18 | 100 % | 110 | 100 % |
| Chi-square= 2.495, Asymp.Sign. (2-sided )= 0.287 | | | | | | |
| **Sex** | **N** | **%** | **N** | **%** | **N** | **%** |
| Male | 80 | 87% | 11 | 61% | 91 | 83% |
| Female | 12 | 13% | 7 | 39% | 19 | 17% |
| Total | 92 | 100% | 18 | 100% | 110 | 100% |

| | | | | | | |
|---|---|---|---|---|---|---|
| Chi-square= 7.146, Asymp.Sign. (2-sided )= 0.028 | | | | | | |
| **Marital Status** | **N** | **%** | **N** | **%** | **N** | **%** |
| Married | 82 | 89 % | 11 | 61% | 93 | 85% |
| Divorced | 3 | 3 % | 3 | 17 % | 6 | 5 % |
| Widow | 7 | 8 % | 4 | 22 % | 11 | 10 % |
| Total | 92 | 100 % | 18 | 100 % | 110 | 100 % |
| Chi-square= 9.573 Asymp.Sign. (2-tailed )= 0.08 | | | | | | |
| **Educational Status** | **N** | **%** | **N** | **%** | **N** | **%** |
| Illiterate | 49 | 53% | 12 | 67% | 61 | 55 % |
| Grade 1-8 | 34 | 37% | 4 | 22% | 38 | 35 % |
| Grade 9-12 | 7 | 8% | 2 | 11% | 9 | 8 % |
| >12 or college | 2 | 2% | 0 | 0% | 2 | 2 % |
| Total | 92 | 100% | 18 | 100% | 110 | 100 % |
| Chi-square=2.338 Asymp. Sig. (2-tailed)=0.674 | | | | | | |

Source, survey result, 2024

## Household family Size

Family size: family size describes that households average family labor force used for agricultural production and improving food security activities.

The average family size of the total households in the study area was 5.51 with standard deviation of 1.749. The result shows that the mean labors of producers were 5.58 and the mean labor of non-producers were 5.17.

The family sizes among the sampled households range from a minimum of 3 to a maximum of 10.The mean family sizes for both groups are similar, and statistical tests reveal that the difference between the two mean family sizes is not significant at the 10 percent level of confidence.

4. 2 Sample Households' family size

| **HH Groups** | **N** | **Min** | **Max** | **Sum** | **Mean** | **Std. Deviation** |
|---|---|---|---|---|---|---|
| Producers | 92 | 3 | 10 | 513 | 5.58 | 1.774 |
| Non-Producers | 18 | 3 | 9 | 93 | 5.17 | 1.618 |
| **Total** | **110** | **3** | **10** | **606** | **5.51** | **1.749** |
| T = 0.907 p = 0.366 | | | | | | |

Source, survey result, 2024

### 4.1.2. Socio-economic characteristics

**Land Ownership**

Large arable land ownership directly correlates with increased crop production and household food security. The availability of irrigable land is also important for farming households to involve in cash crop production and intensify production.

4. 3 Sample Households land size in hectar previous year (2022/23*)*

| HH Groups | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| Producers | 92 | 1.3125 | 1.575 | .164 |
| Non-Producers | 18 | 1.055 | 1.478 | .348 |
| Total | 110 | 5.08 | 1.598 | .152 |
| T = 2.559 | | sign. (2-tailed) = 0.012 | | |

Source, survey result, 2024

According to the household survey results, as shown in Table 4.3, the average land size for producer households during the 2022/23 cropping year was 1.3125 ha, compared to 1.055 ha for non-producer households. This indicates that producers had a larger average land size than non-producers during the same period. The t-test confirms that this difference is statistically significant at the 10 percent level of confidence.

**Ox Ownership**

Oxen are crucial assets for land cultivation and play a significant role in farm productivity. Households with more oxen generally have a better chance of achieving food security, as oxen enable timely and efficient farm operations. Research by (Ejersa, 2011) supports this, showing that oxen ownership positively and significantly contributed to food security. Therefore, the number of oxen available to a household is expected to increase the likelihood of being food secure.

4. 4 farm Ox Ownership by sample households in previous year

Source, survey result, 2024

| Oxen(No) | HH Group Category | | | | | |
|---|---|---|---|---|---|---|
| | Producers n=92 | | Non-Producers n=18 | | Total n=110 | |
| | N | % | N | % | n | % |
| One | 9 | 10 % | 5 | 28 % | 14 | 12.72 % |
| Two | 72 | 78 % | 13 | 72 % | 85 | 77.3 % |
| Three | 3 | 3.3 % | 0 | 0 % | 3 | 2.72 % |
| >four | 5 | 5.4 % | 0 | 0 % | 5 | 4.54 % |
| None | 3 | 3.3 % | 0 | 0 % | 3 | 2.72 % |
| Total | 92 | 100 % | 18 | 100 % | 110 | 100 % |
| Mean | 2.14 | | 1.72 | | | |
| SD | 0.793 | | 0.461 | | | |
| T = 2.168 | | | sign. (2-tailed) = 0.032 | | | |

The results presented in Table 4.4 indicate that 10% of producing households and 28% of non-producing households own only one ox. In contrast, the majority of both groups, 78% of producers and 72% of non-producers, own two oxen. The average number of oxen owned by producers was 2.14, while non-producers average 1.72 oxen. Statistical analysis confirms a significant difference in the average number of oxen owned between the two groups.

Research by Ejersa (2011) highlights that oxen ownership positively and significantly impacts food security. Therefore, having more oxen is expected to increase a household's likelihood of being food secure.

**Participation in off- farm activity:** Households often participate in different activities in addition to agricultural sector to improve their food security. 50 % of total households participated in off-farm activities whereas, 50 % from total households who did not participate off-farm activity. From onion producer households 47 % participated in off-farm activities and 53 % of them didn't participated off-farm activity.

Similarly, from non-producer participants 67 % participated in off-farm activities and 33 % of them didn't participated off-farm activity as shows in Table 4.6. All of households have been

participating in two off-farm activities, trade 44 % and employment 6 % in addition to agricultural activities.

The result implies that most of non-producers (67 %) participated in off-farm activities could be more important to improve food security. Whereas, 47 % of onion producer households

participated in off-farm activities in addition to other agricultural activities could be more important to improve food security. The Chi-square test shows that, there was insignificance difference in participating off-farm activities between onion producers and non-producers at 10 % significant level (Chi-square = 2.391; Asymp.sig. (2-sided) = 0.122). The result shows that, non-producers had a chance to participate in off-farm activities than onion producers. This is because of onion production takes time and labor.

4. 5 Participation of Off-farm activity by sample households in previous year

| Variable | | Producers | | Non-Producers | | Total HHs | |
|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % |
| Participation of Off-farm activity | Yes | 43 | 47 | 12 | 67 | 55 | 50 |
| | No | 49 | 53 | 6 | 33 | 55 | 50 |

Source, survey result, 2024

### 4.1.3. Institutional characteristics

**Agricultural Extension Services:** regarding with this variable the researcher was asked the respondents to know the frequency of contact with development agent within a year. Table 4.6 shows that, 100% of onion producers and 56% of non-producers have get access to extension services and the mean frequency of contact with development agent in a year for onion producers were 10 times with standard deviation of 2.693 and the mean frequency of contact with development agent in a year for non-producers were 2 times with standard deviation of 1.381. The t-test analysis result of this variable were t = 13.144; sig. (2-tailed) = 0.00; $\alpha = 0.1$ shows that, there was a positive significance mean difference in frequency of contact with development agent in a year between onion producers and non-producers at 10% significant level. Therefore, onion producers had more chance to get access to extension services about agricultural technology utilization of small-scale onion production from development agent than non-producers.

**Credit use:** Credit is an important institutional service to finance poor farmers for the purpose of input purchase and ultimately to adopt new technology. However, some farmers have access to credit while others may not have due to problems related to high interest rate. As indicated in Table 4.7, from the total households only 17 % of households had a chance to credit use. About 18.5 % of onion producers and 11 % of non-producers had received credit in the previous years. The result

indicates that irrigation participants received more credit than non-irrigation participants. The chi-square test at 5% significant level (Chi-square = 0.572; Asymp.sig. (2-sided) = 0.450. The result shows that, there was insignificance difference in access to credit between onion producers and non-producers.

**Access to market information:** The result in Table 4.6 shows that, 100 % of total households have access to market information about prices of product and market demand for their product, from different sources of information like, neighbors, DAs, farmer originations, input suppliers, and from mass media respectively. The chi-square result of this variable shows that, there was insignificance difference between onion producers and non-producers participants accessibility to market information and decision to participate in onion production in the study area at 10 % significant level (Chi-square = 1.716; sig. = 0.788).

**Access to irrigation:** As shows in Table 4.6, 100 % of onion producers had access to irrigation. Whereas, 100 % of non-producers had not access to irrigation due to the scarcity of water and had not access to modern irrigation technology with balance price.

The chi-square test at 10 % significant level (Chi-square = 110; sig. = 0.000). The result shows that, there was a significance difference in access to irrigation between onion producers and non-producers participants. So, onion producers 100% had a chance to access irrigation to produced onion. Whereas, non-producers completely had not access to irrigation system.

4. 6 Sampled households' Institutional factors (Access to Extension service, credit use, access to market, and access to irrigation)

| Institutional factors | | Producers | | Non-Producers | | Total HHs | | $Chi^2$ |
|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | |
| Access to Extension service | Yes | 92 | 100 | 10 | 56 | 102 | 93 | 44.096 |
| | No | 0 | 0 | 8 | 44 | 8 | 7 | |
| Credit Use | Yes | 17 | 18.5 | 2 | 11 | 19 | 17 | 0.572 |
| | No | 75 | 81.5 | 16 | 89 | 91 | 83 | |
| Access to Market | Yes | 92 | 100 | 18 | 100 | 110 | 100 | 1.716 |
| | No | 0 | 0 | 0 | 0 | 0 | 0 | |
| Access to Irrigation | Yes | 92 | 100 | 0 | 0 | 92 | 100 | 110.00/ Asymp.sig.(2-sided)=0.000 |
| | No | 0 | 0 | 18 | 100 | 18 | 100 | |

Source, survey result, 2024

## 4.2. Contribution of onion production to household food security

Food security is a comprehensive concept applied at various levels, including national, regional, and household or individual levels. According to the 1996 World Food Summit, food security is realized when everyone has physical, social, and economic access to sufficient food to meet their dietary needs and preferences for a healthy and active life (FAO, 2010).

This study utilized the three pillars of household food security: availability, access, and utilization as defined by the World Bank (1999) to assess the impact of onion production on household food security. This approach reflects the understanding that food security encompasses more than just production; it also involves ensuring that food is accessible and properly utilized to support overall well-being.

### 4.2.1. Food Availability (Own production)

Food availability refers to the physical presence of food in a specific area through domestic production, commercial imports, and food aid. Local food production, market mechanisms, and contributions from government or aid organizations influence it.

In the study area, due to limited production, inadequate storage facilities, and the need to address immediate financial needs, farmers often sell their produce during harvest periods and rely on market purchases during rain seasons.

The primary cereal crops grown in the area include Teff, Sorghum, and Maize. The household survey results indicate that, during the previous cropping year 2022/2023, onion-producing households cultivated an average land of 1.3125 ha for onion and staple crops stagger, while non-producing households cultivated an average land of 1.055 ha. This is because of using crop rotation of cash and staple crops are common between households of onion producers in the study area. As shown in Table 4.2, the average land area used for cereal production by onion-producing households is larger than that of non-producing households. The statistical analysis confirms a significant difference at the 10 percent level of confidence.

Table 4.7 shows that the mean income from cereal crop production for the previous year was Birr 170,304.89 for onion-producing households and Birr 143,172.22 for non-producing households. This shows a difference of Birr 27,132.67 in favor of the producing households. However, the T-test indicates that this difference is not statistically significant at the 10 percent level confidence.

4. 7 HHs average total cereal income from the 2022/23 Production year (1year)

| **HHs Group** | | **N** | **Mean** | **Std, Deviation** | **Std. Error Mean** |
|---|---|---|---|---|---|
| Total Cereal income | Producer | 92 | 170,304.89 | 89535.834 | 9334.756 |
| | Non-Producer | 18 | 143,172.22 | 60498.097 | 14259.538 |
| T= 1.592 | | sig.(2-tailed)= 0.121 | | | |

Source, survey result, 2024

Households were questioned about whether their own production from the previous year was sufficient to feed their families throughout the year. The survey results in table 4.8 revealed that 53 (57.6%) of the onion-producing households and 5 (27.8%) of the non-producing households reported having adequate food from their own production for the entire year. The remaining households could only sustain their families with their own production for less than eight months. The chi-square test indicates a significant difference at the 10 percent level of confidence.

4. 8 HHs response on sufficiency of own food production in the previous cropping year (2022/23)

| HHs Group | | In last year, did you produce staple food adequate for household consumption? | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Producers | Count | 53 | 39 | 92 |
| | % | 57.6 % | 42.4 % | 100 % |
| Non-Producers | Count | 5 | 13 | 18 |
| | % | 27.8 % | 72.2 % | 100 % |
| Total | Count | 58 | 52 | 110 |
| | % | 52.7 % | 47.3 % | 100 % |
| Chi-square= 5.375 | | sign. (2-tailed)= 0.020 | | |

Source, survey result, 2024

**Quantity of onion produced**

The household survey data indicates that for onion production during the 2022/2023 cropping year, onion-producing households had an average cultivated land size of 0.33 hectares, with a minimum of 0.25 hectares, and a maximum of 1 hectare. The mean onion production for these households was 72 Qt/ha.

4. 9 Cultivated land and Onion production by HHs in previous year (2022/23)

| | Producers /N/ | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Land cultivated 2022/2023 for onion in hectar | 92 | 0.25 | 1 | 0.33 | 0.7569 |
| Onion production in Qt/ha | 92 | 27 | 172 | 72 | 31. 872 |

Source, survey result, 2024

According to Key informant interview (KII) respondents noted that the productivity of onions production practiced by smallholder farmers was lower than compared to recommend practiced. For Example onion productivity practiced in the study area was approximately a maximum 160 to180 Qt/ha, but, 240 Qt/ha productivity was recommend practiced. Experts from the Kobo

Town Agriculture Office said that attributed the reduced production and productivity to several factors, including disease outbreaks, insect infestations, market fluctuations, low onion prices, climate variability, and unstable input costs. Similar constraints were highlighted by (Kassu Sagara, 2022)), who identified disease, insect outbreaks, market price instability, climatic fluctuations, and input cost issues as significant barriers to onion production.

### 4.2.3. Contribution to Food Access (Ability to purchase food from Market)

A household's ability to access adequate food can depend on various factors, including home production, stocks, purchases, gifts, borrowing, and food aid. Accessibility is often evaluated through the lens of purchasing power and physical access to food sources. Even if food is available in an area, it may not be accessible to all households if they lack the means to acquire enough or diverse food through these methods. In this context, the contribution of onion production to household food security is examined from several angles: its role in generating income, creating employment, and building assets.

**Income generation**

Data from the sampled household survey indicate that onion production offers substantial economic benefits. The primary economic advantage is income generation. According to Table 4.10, the average income earned from onion sales was 304,494.29 birr, ranging from a minimum of 105,000 birr to a maximum of 772,400 birr. This highlights the significant role of onion production in enhancing household income.

4. 10 Income gained from Onion Sale by sample HHs (2022/23)

| | **Producers /N/** | **Minimum** | **Maximum** | **Mean** | **Std. Deviation** |
|---|---|---|---|---|---|
| Money income obtained from sale of onion in the previous year ( in Birr) | 92 | 105000 | 772400 | 304494.3 | 149571.53 |
| T-value= 19.526 | | sign. (2-tailed)= 0.000 | | | |

Source, survey result, 2024

During the focus group discussion (FGD), participants noted that income from onion production is used to cover both food and non-food expenses, including health, education, clothing, and

transportation. This income helps sustain their lives and allows them to purchase essential consumables and manage other expenses.

According to the household survey results in Table 4.11, the main sources of food for households were their own production and market purchases. During times of food scarcity, households depend on purchasing food. For onion-producing households, income from onion sales is a key source of funds, while non-producing households rely on income from cereal sales and other sources to purchase food.

4. 11 Sample HHs response on way of filling food gaps in the last two years (2022/23)

| HHs Group | | Ways of filling food gaps in last Year? | | | | | |
|---|---|---|---|---|---|---|---|
| | | Purchased from market | Food aid | Food gift | Purchased and aid | Other specify | Total |
| Producers | Count | 41 | 0 | 0 | 0 | 0 | 41 |
| | % | 44.56 % | 0 | 0 | 0 | 0 | 44.56 % |
| Non-Producers | Count | 13 | 0 | 0 | 0 | 0 | 13 |
| | % | 72.22 % | 0 | 0 | 0 | 0 | 72.22 % |
| Total | Count | 54 | 0 | 0 | 0 | 0 | 54 |
| | % | 49 % | | | | | 49 % |

Source, survey result, 2024

As shown in Table 4.12, among the 54 households unable to produce sufficient food in the past year, 41 (44.56%) of the onion-producing households and 13 (72.22%) of the non-producing households addressed their food shortages through market purchases.

The survey results indicate that 41 of the 92 onion-producing households (44.56%) used cash income from onion sales to buy food, whereas 13 non-producing households (72.22%) relied on income from cereal sales and other sources to purchase food. Table 4.12 illustrates that onion sales are the primary source of cash income for food purchases among onion producers, which contributes to their food security. In contrast, non-producing households often exhaust their valuable assets, such as cereals and other resources, to manage food shortages, which can exacerbate their food insecurity.

4. 12 Source of money utilized for food purchase from market in last year

| HHs Group | | if you purchased from market, the source of money for food purchased | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | Income from Sale of onion | Sale of livestock | loan | Sale of cereals | Other sources | |
| Producers | Count | 41 | 0 | 0 | 0 | 0 | 41 |
| | % | 44.56 % | 0 | 0 | 0 | 0 | 44.56 % |
| Non-Producers | Count | 0 | 0 | 0 | 8 | 5 | 13 |
| | % | 0 % | 0 | 0 | 0 | 0 | 72.22 % |
| Total | Count | 41 | 0 | 0 | 8 | 5 | 54 |
| | % | 44.56 % | 0 % | 0 % | 44.44 | | 49 % |

Source, survey result, 2024

**Share of Various Income Sources to Households Income**

Farm households derive income from various sources, including onion sales, cereals, livestock and livestock products, other off-farm/non-farm activities, fruits, and other vegetables. As shown in table 4.14, the mean cereal income for producing households in the previous year was higher than that of non-producers by 27,132.67 birr. However, the statistical test indicates no significant variation at the 10% level. Similarly, the mean income from livestock and livestock products was higher for producing households compared to non-producing ones. While off-farm/non-farm income contributed less overall, producing households still earned slightly more from these activities than non-producers, with a significant variation at less than 10% confidence level. Notably, the mean income from onion sales for producing households was 304,494.29 birr, which far exceeds the income difference from other sources between these groups. In the previous year, the mean total income for producers was nearly three times that of non-producers, with onion income contributing 36% of the total, making it the most significant income source.

4. 13 Share of each income source from the sum of mean income of sample households in the previous year (2022/23 cropping year).

| Income Sources | Producers | | Non-Producers | |
|---|---|---|---|---|
| | Mean Income in Birr | % share | Mean Income in birr | % Share |
| Total income from onion | 304494.29 | 36 % | - | - |
| Total income from Cereal | 170304.89 | 20 % | 143172.22 | 56 % |

| | | | | |
|---|---|---|---|---|
| Total income livestock / product sale | 74862.16 | 9 % | 40139.29 | 16 % |
| Off farm/non-farm income | 85247.62 | 10 % | 72666.67 | 28 % |
| Total income from sale of Fruit | 93380.00 | 11 % | - | - |
| Total income from other vegetable | 113200.00 | 14 % | - | - |
| Total Income | 841,488.96 | 100 % | 255,978.18 | 100 % |

Source, survey result, 2024

**Employment opportunity**

The analysis of labor requirements for agricultural activities highlights the seasonal nature of labor needs, which peak during key agricultural periods such as land preparation, sowing, weeding, and harvesting. To address labor shortages, especially for families with insufficient internal labor, households often rely on external sources.

Table 4.14 indicates that 68 % of onion-producing households and 72 % of non-producing households use wage labor to manage their agricultural tasks.

Despite the use of wage labor by a significant portion of both groups, the chi-square test results show that the difference in labor usage between onion Producers and non-producers were not statistically significant at the 10 percent level of confidence. This finding suggests that the reliance on wage labor for overcoming labor shortages is similar across both groups, regardless of their involvement in onion production.

4. 14 Sample households Labor shortage compensation Mechanisms in last year

| How did you solve the problem of labor shortage? | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| HH Category | Friends & relatives | | Wage labor | | Debo (wenfel) | | Friends &wage labor | | Other specify | |
| | N | % | N | % | N | % | N | % | N | % |
| Producers | 7 | 7.6 | 63 | 68 | 1 | 1 | 19 | 21 | 2 | 2 |
| Non-Producers | 2 | 11 | 13 | 72 | 0 | 0 | 3 | 17 | 0 | 0 |
| Total | 9 | 8 | 76 | 69 | 1 | 6 | 22 | 20 | 2 | 2 |
| Chi-square= .963 asymp.sign.(2-tailed)=0.915 | | | | | | | | | | |

Source, survey result, 2024

Table 4.15 shows that 89% of onion-producing households and 83.33% of non-producing households reported an increase in wage labor employment demand over the last year. This indicates that onion production contributes to the creation of employment opportunities, which is

consistent with findings from (Ejersa, (2011), study in Holeta Town. However, the chi-square test reveals that the difference in the trends of wage labor employment between onion producers and non-producers is not statistically significant at the 10 percent level of confidence.

4. 15 Trends of wage labor Employment during last year (2022/23)

| Wage Labor Employment Trend | | | |
|---|---|---|---|
| HH Category | Increased | Remains the same | Decreased |
| Producers | 82 (89 %) | 6 (6.52 %) | 4 (4.34) |
| Non-Producers | 15 (83.33 %) | 1 (5.55 %) | 2 (11.11 %) |
| Total | 97(88.18 %) | 7 (6.36 %) | 6 (5.45 %) |
| Chi-square= 1.342 | asymp.sign.(2-tailed)=0.511 | | |

Source, survey result, 2024

**Contribution to Asset Building**

Farmers who are engaged in onion production get better income from sale of onion. In addition to covered food and non-food expenditures, they also contributed to building household assets like vehicle assets (cycle, cart, Bajaj, car/trucker), livestock assets (ox, cow, donkey, camel,small ruminants), land assets, house constructed, saving deposit, and social asset.Those assets are important for ensuring food security by filling the food gap at the time of food shortage.

According to HHs survey, the result shown in Table 4.16, among the 92 producing households onion production contributed to access vehicle assets in 20households (22 %), contributed to access livestock assets in 60 households (65 %), contributed to access land assets26 households (28 %), contributed to access cash deposit or saving money 83 households (90 %), cover from sale of onion income for future consumption. The chi-square test confirms that the contribution of onion production to asset building among households is significant at the 10 percent level of confidence. This indicates that onion production not only supports immediate food and non-food needs but also plays a crucial role in enhancing long-term food security by enabling households to build and maintain valuable assets.

4. 16 Onion Production contribution to HHs asset building during the last year (2022/23)

| Contribution of onion production to asset building | Producer n=92 |
|---|---|
| | |

| | n | | % |
|---|---|---|---|
| Help in Vehicle asset Building? | Yes | 20 | 22 % |
| | No | 72 | 78 % |
| | Total | 92 | 100 |
| Help in livestock asset Building? | Yes | 60 | 65 % |
| | No | 32 | 35 |
| | Total | 92 | 100 |
| Help in house building /land asset building? | Yes | 26 | 28 % |
| | no | 66 | 72 |
| | Total | 92 | 100 |
| Help Cash deposit / save money? | Yes | 83 | 90 % |
| | no | 9 | 10 |
| | Total | 92 | 100 |
| Chi-square= 5.232 asymp.sign.(2-tailed)=0.022 | | | |

Source, survey result, 2024

During FGD, the participants revealed that high productivity with competitive Selling price of onion have better purchasing power of food and non-food expenditures would be able to lead for ensuring household food security in the study area. Furthermore, onion production helped them to build assets like, vehicle asset, livestock asset, land/house asset, saving deposit, and social asset for present and future consumption.

### 4.2.4. Contribution to Food Utilization

In the context of food security, food utilization involves not only having sufficient food but also ensuring that the food consumed meets nutritional needs and is used effectively.

According to Table 4.17, to cover non-food expenses such as education, healthcare, ceremonies, and clothing, smallholder farmers reliant on subsistence agriculture often face the difficult choice of selling valuable assets or depleting their staple food reserves. This lack of alternative income sources makes them vulnerable to food shortages.

The household survey results reveal that among the 92 producing households with children in school, 63 (68.5%) covered their education expenses through onion sales. In contrast, of the 18 non-producing households with school-aged children, only 9 (50%) used income from non-farm activities to cover education costs.

Ceremonial and medical expenses, the data indicates that among the 92 producing households with ceremonial expenses, 58 (63%) used income from onion sales, while 20 (21.7%) used other income sources, 8 (8.7%) used livestock sales, and 6 (6.6%) used cereal sales.

In comparison, of the 18 non-producing households with ceremonial expenses, 12 (67%) relied on other income sources, 4 (22%) on cereal sales, and 2 (11%) on livestock sales. This suggests that producing households were less likely to sell food crops or valuable assets for such expenses. For medical expenses, 53 (57.6%) of the producing households covered costs through onion sales, while 30 (32%) used food crop or livestock sales, and the rest used other income sources.

Among non-producing households, 10 (55%) covered medical expenses through food crop and livestock sales, while the remainder used other income sources.

Regarding clothing and footwear, 54 (59%) of the producing households covered these expenses through onion sales, while 9 (50%) of non-producing households used income from other sources. The remaining households in both groups used sales of livestock and cereals.

These findings imply that producing households generally have better purchasing power to cover non-food expenditures compared to non-producing households. This supports the study by Abadi (2008), which also found that cash cropping significantly contributes to covering non-food

expenses for producer households. Non-producers, however, rely more on other sources of income for these expenses. Focus group discussions further confirmed that onion production helps households sustain their lives, purchase essential services, and cover other expenses. This is attributed to onions being an off-season crop with high productivity and competitive selling prices compared to other crops

4. 17 Income used to cover expenditure of household's non-food expenses

| HHs Category | **HHs response on Source of money for educational fee** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sale of onion | | Sale livestock | | Sale of cereals | | Other sources | | loan | | Total | |
| | N | % | n | % | n | % | n | % | n | % | n | % |
| Producers | 63 | 68.5 % | 9 | 9.8 % | 6 | 6.5% | 14 | 15.2% | 0 | 0% | 92 | 100% |
| Non-Producers | 0 | 0 % | 3 | 17 % | 6 | 33 % | 9 | 50 % | 0 | 0 % | 18 | 100 % |
| **Total** | **63** | **57 %** | **12** | **11 %** | **12** | **11 %** | **23** | **21 %** | **0** | **0 %** | **110** | **100 %** |
| Chi-square= 31.611 asymp. Sign. (2-tailed)= 0.000 | | | | | | | | | | | | |
| **HHs response on sources of money for medication** | | | | | | | | | | | | |
| Producers | 53 | 57.6 % | 22 | 23.9 % | 8 | 8.7 % | 9 | 9.8 % | 0 | 0 % | 92 | 100 % |
| Non-Producers | 0 | 0 % | 6 | 33 % | 4 | 22 % | 5 | 28 % | 3 | 17 % | 18 | 100 % |
| **Total** | **53** | **48.1 %** | **28** | **25.5 %** | **12** | **11%** | **14** | **12.7** | **3** | **2.7** | **92** | **100 %** |
| Chi-square= 32.583 asymp. Sign. (2-tailed)= 0.000 | | | | | | | | | | | | |
| **HHs response on Source of money to cover the ceremonial expenses** | | | | | | | | | | | | |
| Producers | 58 | 63 % | 6 | 6.6 % | 8 | 8.7 % | 20 | 21.7 % | 0 | 0 % | 92 | 100 % |
| Non-Producers | 0 | 0 | 2 | 11 % | 4 | 22 % | 12 | 67 % | 0 | 0 % | 18 | 100 % |
| **Total** | **58** | **53%** | **8** | **7 %** | **12** | **11 %** | **32** | **29 %** | **0** | **0 %** | **110** | **100 %** |
| Chi-square= 24.754 asymp. sign.(2-tailed)=0.000 | | | | | | | | | | | | |
| **HHs response on Source of money for clothing and foot wear** | | | | | | | | | | | | |
| Producers | 54 | 59 % | 14 | 15 % | 17 | 18.4 % | 7 | 7.6 % | 0 | 0 % | 92 | 100 % |
| Non-Producers | 0 | 0 % | 3 | 17 % | 6 | 33 % | 9 | 50 % | 0 | 0 % | 18 | 100 % |
| **Total** | **54** | **49 %** | **17** | **15.5 %** | **23** | **21 %** | **16** | **14.5 %** | **0** | **0 %** | **110** | **100 %** |

Source: survey result 2024

## 4.4 .Categorization of households into Food secure and Food Insecure

### Household food consumption score

Access to sufficient food and nutrients is vital for household welfare and achieving broader development objectives. Households with inadequate access to food often encounter challenges related to food insecurity, including poor health and reduced productivity. The data on food consumption of 110 households were collected for this study designed for capturing the variety and frequency of different foods consumed over a 7 days recall period.

Therefore, to examine the status and contribution of onion production to household food security was assessed using the Food Consumption Score (FCS) method, originally adapted from the World Food Programme(WFP, 2008). The weighting of food groups in this method is based on the nutritional richness of each category (WFP, 2008). According to this method, households with an FCS of 0–28 are considered to have inadequate food consumption, those with a score of 28.5–42 are classified as borderline, and those with a score of 42 or higher are regarded as having adequate food consumption.

Table 4.18 result shows that sample households' food security status using food consumption score for both onion producer and non-producer households were, 73 % onion producers with acceptable food consumption were 22 % had borderline consumption and 5 % were poor food consumption score.

On the other hand the results shows that, non-producer sample households with acceptable food consumption were 28 %, 33 % of the households had borderline consumption and 39 % with poor food consumption score. According to the food consumption score, households with poor consumption are regarded as food insecure, while households with borderline consumption are categorized as moderately food insecure and the households with acceptable food consumption were categorized as food secure.

The chi square test of food consumption score for irrigation participants were 67 categorized as food secure and the chi square test of food consumption score for non-irrigation participants were 5 categorized as food secure. Table 4.18 shows that, there was a significant food consumption mean difference between onion producer and non-producer sample households at 10 % chi square significant level (Pearson Chi-Square = 20.968, Asymp.Sig. (2-sided) = 0.000).

4. 18 Sample HHs Food Security Status Based Food Consumption Score

| Food Consumption Score | Producers ( N = 92 ) | | Non-Producers ( N = 18 ) | | Total Sample HHs ( N=110 ) | |
|---|---|---|---|---|---|---|
| | Frequency | % | Frequency | % | Frequency | % |
| Adequate food consumption ( >42 ) | 67 | 73 | 5 | 28 | 72 | 65 |
| Borderline food consumption(28.5-42 ) | 20 | 22 | 6 | 33 | 26 | 24 |
| Poor food consumption ( 0-28 ) | 5 | 5 | 7 | 39 | 12 | 11 |
| Total | 92 | 100 | 18 | 100 | 110 | 100 |

Source, survey result, 2024

According to (WFP, 2008) classifying households with poor and borderline FCS as food insecure and those with adequate FCS as food secure, it can be concluded that 65% of households in the study area are food secure, while 35% are food insecure. The data, based on FCS, demonstrate that a higher proportion of food-secure respondents are found among onion producers, highlighting the positive contribution of onion production on household food security.

4. 19 Food Security Status of HHs

| Food Security Status | HHs Group Category | | | | | |
|---|---|---|---|---|---|---|
| | Producers N = 92 | | Non – Producers N = 18 | | Total | |
| | N | % | N | % | N | % |
| Secured | 67 | 73 % | 5 | 28 % | 72 | 65 % |
| In secured | 25 | 27 % | 13 | 72 | 38 | 35 % |
| Total | 92 | 100 % | 18 | 100 % | 110 | 100 % |

Source, survey result, 2024

According to FGD respondents, they were identified that the type of food consumed at home varies between onion producers and non- producers. All the participants confirmed the fact that onion producer households consumed more diversified food than non-producer households. This is clearly indicating that because of onion production contributed to diversified food to be food secured.

## 4.5. Opportunities and constraints of onion production

In the research area, onion production presents both opportunities and constraints. According to the study, which includes insights from Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), and survey results from sampled households, farmers face several challenges in onion production. However, despite these constraints, there were some opportunities for onion production in the area. These constraints and opportunities were discussed further below.

### 4.5.1. Opportunities of Onion Production in the study area

The Kobo area is a highly suitable agro-ecological zone, not only for onion production but also for a diverse range of other agricultural commodities, including vegetables, cereals, pulses, fruits, and animal production. The region holds significant potential for vegetable cultivation, including onions, tomatoes, cabbage, green peppers, and watermelon. Additionally, cereal crops such as teff, sorghum, maize, and wheat, along with pulses and improved local breeds of animals for milk production, are among the area's agricultural strengths. The availability of relatively fertile arable land and abundant groundwater further enhances the region's agricultural prospects. Kobo's strategic location along the main road connecting Addis Ababa to Mekele, and its proximity to Woldia University, just 42 kilometers away, provide a unique advantage. This short distance allows farmers to supply perishable crops like onions to large markets in a timely manner, reducing the risk of spoilage. Moreover, the region benefits from conducive government agricultural policies and favorable weather conditions, which are ideal for crop and vegetable production. The area's infrastructure has also seen improvements, with better access to mobile and landline telephones, electricity, groundwater, and all-weather roads, all of which support onion production and marketing.

A significant opportunity in the region is the presence of various governmental organizations, including the Kobo Girana Valley Irrigation Program Office, local universities, different NGO projects, the Kobo Town Agriculture Office, and the Sirnika Agricultural Research Institute. These institutions play a crucial role in disseminating agricultural technology innovations, further boosting the agricultural potential of the area.

According to the Sample Household Survey and Focus Group Discussion (FGD) results, several opportunities for onion production were identified based on their frequency of mention.

These include sufficient water and land resources, the existence of irrigation schemes, availability of groundwater potential for irrigation, organized farmers as part of irrigation water user cooperatives, and the availability of wholesale trade. Other significant opportunities highlighted by respondents include the accessibility of infrastructure facilities such as electricity, roads, and telephone services, increasing demand driven by population growth and rising purchasing power, and the study area's proximity to the main asphalt road, particularly in Kobo-zurya Kebele.

FGD participants specifically pointed out key irrigation schemes that impact onion production, such as the "Hormat-Golina" schemes numbered 4, 6, 7, 8, 10, 28, 29, 34, 35, and "Nigat" in Kobo Zurya Kebele. These schemes are vital for the area's onion production, with most farmers growing onions once a year (from January to March), although some can produce twice a year (from April to August and from January to March). Depending on soil fertility, farmers achieve an average yield of 108 quintals per hectare, with an average selling price of 4,000 to 4,300 Birr per quintal, as reported by the Kobo-Girana Valley Development Program Office in 2015 (E.C.).

Key Informant Interviews (KIIs) revealed that the common food items in the area, as reported by health extensionists, include traditional staples like "Enjera," "Kolo," "Genfo," "Kitta," and "Dabo" made from teff and wheat, along with local drinks such as "Tela" made from sorghum and "Tejji" from honey and sugar. Other food items include "Bira," milk, "Ergo," and meat from animal products, and occasionally root crops like Irish potato and sweet potato. Participants noted that the dietary diversity among producers in the area has improved recently compared to non-producers.

Additionally, the presence of institutions like Sirinka Agricultural Research Center, Woldia University, and Wollo University was cited as a significant opportunity. These institutions support agricultural inputs and market access linkages, which could enhance income, dietary diversity, and overall consumption in the study area.

### 4.5.2. Constraints of Onion Production in the study area

Several constraints have hampered the contribution of onion production to household food security in Kobo town during the production years of 2014/2015 E.C. According to responses from household producers, Focus Group Discussions (FGDs), and Key Informant Interviews (KIIs), the most frequently reported challenges include the war between the Ethiopian government and TPLF, which has disrupted agricultural facilities. Additionally, limited supply of improved seeds, imperfect pricing of agricultural inputs, outbreaks of diseases and pests, fluctuating selling prices of onions, and lack of access to credit are among the most significant problems identified by the respondents. Based on this, the constraints have been discussed below:

#### 4.5.2.1 War between Ethiopia Government and TPLF (Tigray People Liberty Front)

Before the war, there were 12 functional irrigation schemes in the area. Currently, only 5 of these schemes are functional, but, others damaged by the conflict. The war has had a detrimental impact not only on the irrigation schemes but also on onion production and productivity. Key issues include disruptions in the production process due to a lack of electricity, challenges in marketing caused by inadequate market linkages between buyers and sellers, and shortages of essential inputs such as seeds, fertilizers, pesticides, and insecticides. As a result, farmers have been forced to switch to growing other cereal crops, as onions require more water than these alternatives.

#### 4.5.2.2 Limited Supply of Improved Seed and Imperfect Price of Inputs

Household producers and Focus Group Discussion (FGD) participants reported significant input constraints. All surveyed households (100%) indicated that the cost of inputs is beyond their financial capacity, making them unaffordable. A particular challenge highlighted by all producer households was the lack of improved seeds. Additionally, both FGD participants and surveyed producers noted that the absence of commercial fertilizers before the sowing season was a major constraint. Even when cooperatives provided fertilizers, farmers still struggled due to insufficient funds to purchase them.

FGD respondents also observed that counterfeit onion seeds were entering the local market in Kobo town from unlicensed merchants. These seeds, purchased from open markets, lacked certification, quality testing, and guarantees. Consequently, farmers faced issues with low production and poor seed viability due to the use of substandard seeds.

#### 4.5.2.3 Lack of Access to Credit

The lack of agricultural production credit and the unavailability of credit on demand were identified as significant constraints. According to the survey results, only 18% of producing households accessed loans from the Amhara Credit Service Institution (ACSI), which came with high interest rates. In contrast, 82% of producers reported that the absence of credit providers and the unavailability of credit were major constraints affecting their production activities.

#### 4.5.2.4 Outbreak of Disease and Pest

Focus Group Discussions (FGD) with onion producers in the study area revealed several challenges related to pest and disease management. During the rainy season, pests and diseases are particularly problematic, especially during the flowering stage. Although these issues can also

occur during the dry season, farmers primarily use pesticides to control pest damage. However, they often struggle to find pesticides and insecticides in the local market during infestations. Farmers in the discussion identified two main diseases affecting onions: “Wag” (rust) and “Wurch” (frost).

These diseases constrain onion production and impact dietary improvement. Additional challenges include weak supervision and follow-up by extension practitioners, difficulties in sowing at the optimal time, and access issues to safe roads, which negatively affect onion tuber yields and income. Climate variability is another significant concern, impacting onion production. Farmers rarely use herbicides and fertilizers (such as NPS and UREA), and they have limited access to pesticides for controlling rust, which further affects their diet and production outcomes.

# CHAPTER FIVE

# CONCLUSIONS AND RECOMMENDATION

## 5.1. Conclusion

The main objective of this study is to evaluate the contribution of smallholder onion production to household food security in Kobo Town using a cross-sectional survey data.

Multi-stage sampling procedure was used to select 110 sample households. Primary data were collected from household survey, focus group discussion and key informant interview. Different

documents were used to collect secondary data. Descriptive statistics like mean, percentage distribution and inferential statistics like, t-test, chi $^2$ to analyze data.

There are three major factors that affect onion production to household food security at household level. Those are demographic, socioeconomic, and institutional.

The chi-square test reveals that the differences in sex between the two groups were statistically significant at the 10% confidence level. This indicates that female-headed households are underrepresented in onion production. This disparity may be attributed to the labor-intensive nature and high management requirements of onion production, which may exceed the capacity of female-headed households.

The average land size for producer households during the 2022/23 cropping year was 1.3125 ha, compared to 1.055 ha for non-producer households. This indicates that producers had a larger average land size than non-producers during the same period. The t-test confirms that this difference is statistically significant at the 10 percent level of confidence. This indicates that the availability of irrigable land is also important for farming households to involve in onion production and intensify production leads to be food security.

Households with more oxen generally have a better chance of achieving food security, as oxen enable timely and efficient farm operations. Therefore, the number of oxen available to a household is expected to increase the likelihood of being food secured.

Land holding size and oxen owner of households have a chance to increase their production and productivity. Households who have larger land holding size and more oxen ownership of households motivate to participate in onion production. The result shows that, both independent variables have positively influence onion production.

Households who have farm plot near to local market were reducing the transportation cost of purchasing input and selling their irrigation output. The result again shows that, households who have continuously contact with agricultural development agent have more probability of increase production and productivity of onion.

The results showed that households engaged in onion production were generally more likelihood of being food secured compared to non-producing households. Onion farming significantly increased household income, created employment opportunities, and facilitated asset accumulation.

Income from onion sales also helped households meet essential needs of food and non-food expenses such as education fee, healthcare, and ceremonial expenses.

In general, it was observed that the total mean income of producers was almost three time of that of non producers, the major factor for this variation being income from onion sale.

The study found that onion production significantly enhances household food security, assessed through food availability, accessibility, utilization, and stability. Onion producers were notably more food secure than non-producers, largely due to the higher income from onion farming.

Food security was measured using one of a commonly known measurement of food security status of households known as food consumption score. The results based on this measurement shows that, from total households 65 % of them in the study area were food secure and 35 % of them were food insecure. On the other way, 73 % of onion producers were food secure and 28 % of non-producers were food secure.

The study identified several opportunities for enhancing onion production, including the availability of water and land resources, existing irrigation schemes, well-organized farmer cooperatives, infrastructure development, and rising market demand. However, key challenges were also highlighted, including internal conflict, limited access to quality seeds, price fluctuations, disease outbreaks, and credit shortages.

To fully realize the potential of onion production, the study recommends addressing these challenges through continuous monitoring, adapting crop calendars, improving access to modern agricultural inputs, and enhancing market and credit services. Implementing these recommendations could substantially boost onion production and improve the status of household food security farmers in the study area.

## 5.2. Recommendations

Based on the above findings of the study, the following recommendation can be drawn for further consideration and improvement of onion production in the study area in particular and in the country at large.

- The concern bodies should prioritize maintaining the irrigation infrastructure that was damaged by the political conflict.
- A major constraint for onion production in the area is the unreliable seed supply, with seeds often purchased from unlicensed sellers, leading to quality issues. The local administration

should focus on developing local seed production and forming partnerships with reliable suppliers. Effective pest and disease management is also essential to protect production.

- Irrigation user cooperatives should be capacitated to facilitate collective production planning and marketing. Membership in cooperatives is linked to better access to credit, seeds, fertilizers, and market information. Strengthening these cooperatives can significantly enhance onion production in the area
- A key issue in the study area is the unplanned production of onions, where most farmers plant the same vegetables at the same time, leading to oversupply and reduced prices. Extension services should address this by training farmers to stagger planting times and diversify crops using crop calander.
- Additionally, the amount of credit received significantly affects production and productivity. Farmers need external financial support to cover production costs and purchase high-yielding seeds, fertilizers, and agro-chemicals. To address this, rural financial institutions and local administration should coordinate to provide adequate credit and support for sustainable agricultural output.
- Finally, In order that smallholders can benefit from cash cropping area specific and potential based development plan has to be prepared. As mentioned earlier, the study area is rich in ground water potential which could be exploited for expanding the production of other cash crops such as pepper, tomato and haricot bean in addition to onion. Therefore, cash crop production can be promoted with sprinkler or drip irrigation, and development of small scale irrigation schemes.

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# 7. APPENDIXCES

## 7.1. Appendix I: Tables in the Appendices

Appendix Table 1 Weights of food groups

| S/N | Food items | Food group | Weight |
|---|---|---|---|
| 1 | Cereals: Corn, Wheat, Sorghum, Rice, Bread Roots and Tubers: | Staples | 2 |
| 2 | Pulses/Beans/ Nuts Pulses | Pulse | 3 |
| 3 | Milk/ Milk Products Milk | Milk | 4 |
| 4 | Animal Proteins: Fish, Meat, Eggs | Meat and Fish | 4 |
| 5 | Vegetables (including green, leafy vegetables) | Vegetables | 1 |
| 6 | Sugar/ Honey | Sugar | 0.5 |
| 7 | Fruits | Fruits | 1 |
| 8 | Oil and Fats | Oil | 0.5 |

Source: World Food Program (2008)

## 7.2. Appendix II: Data Collection Tools

WOLDIA UNIVERSITY

*College of Social Sciences and Humanities*

*Department Of Geography and Environmental Studies*

This is submitted to the School of Graduate Studies, Woldia University, and In Partial Fulfillment of the Requirements for the Degree of Masters of Arts in *Food Security and Development Program*

Title: The Contribution of smallholder Onion Production to Household Food Security: The case of Kobo town, Amhara, Ethiopia.

General Directions for Onion Producers of Sample Households

Encircle the choice from the options in the space provided for close ended questions and write respondents' responses on the space provided for open-ended questions.

## 1. Supportive Information

- Region : Amhara , Zone:N/wollo , woreda: Kobo town ,kebele : 01 kobo zurya

A. Enumerator: _____

B. Date of the interview: _____

C. Interview Number _____

D. Village number_____

## 2. Sample Household Head Profile

1. Sex: 1) Male 2) Female

2. Age: 1) 18-30, 2) 31-60, 3) >61

3. Educational status attained: 1) Illiterate, 2) Grade1-8,3) Grade 9-12, 4) above 12

4. Marital Status: 1) Single, 2) Married, 3) Divorced, 4) Separated, 5) Widow/widower

5. Total farm size in Ha: ---------

6. Total family size: ----------

7. Total number of Ox ----------

**3. Livestock ownership**

8. How many of the following types and numbers of livestock do you have last year?

| No | Livestock type | Number (count) |
|---|---|---|
| 1 | Oxen | |
| 2 | Cow | |
| 3 | Donkey | |
| 4 | Camel | |
| 5 | Poultry | |
| 6 | Goat | |
| 7 | Sheep | |
| 8 | any other (specify) | |
| **Total** | | |

9. Have you sold any livestock in the past year? 1) Yes, 2) No

10. Please indicate the number of livestock and their products sold in the past year?

| No | Livestock heads | No./amount sold | value in Birr | Reasons to sold |
|---|---|---|---|---|
| 1 | Calf | | | |
| 2 | Hen | | | |
| 3 | Egg | | | |
| 4 | Goat | | | |
| 5 | Sheep | | | |
| Total | | | | |

## 4. Onion and Other Crop production

11. Do you produce onion in the previous cropping year 2022/2023?

1) Yes, 2) No

12. If yes, how many times do you produce in year?

1) One 2) two 3) three 4) four

13. If you faced labor shortage for onion production, how did you solve the problem?

1) Friends and relatives 2) wage labor 3) Debo (Wenfel) 4) Friends, relatives, and wage labor 5) others specify

14. If your answer for question No13is 'wage labor', your labor employment trend in the last 2 years?

1) Increased2) remained the same3) decreased

15. What is the source of money you paid for wage labor?

1) Sale of onion 2) Sale of cereal crop 3) sale of livestock 4) loan 5) cereal and livestock 6) others specify

16. In addition to onion, what are the major crops produced and income earned in the previous year **2022/23**?

| Major Crops | Specified crops | Area in ha | Produced in (Qntl) | Consumption In Qnl | Seed In Qnl | Market In Qnl | Saved In Qnl | Unit price | Annual income in Birr |
|---|---|---|---|---|---|---|---|---|---|
| Cereals | Teff | | | | | | | | |
| | Maize | | | | | | | | |
| | Sorghum | | | | | | | | |
| | Wheat | | | | | | | | |
| Vegetables | Onion | | | | | | | | |
| | Cabbage | | | | | | | | |
| Fruits | Mango | | | | | | | | |
| Pulse | Chickpea | | | | | | | | |
| By product | | | | | | | | | |
| Others specify | | | | | | | | | |
| Total | | | | | | | | | |

17. Do you have Market access? 1) Yes 2) No

18. If yes, where did you sell your onion products?

1) Local market/Kobo/ 2) Central market 3) abroad 4) others

19. What is your source of market information regarding to onion (Multiple response possible)

1) Neighbors, 2) Extension agents, 3) Farmer organizations, 4) Input suppliers,5) Mass Media (TV, Radio, News Papers

20. Do you have access to credit in the last years? 1) Yes, 2) No

21. In your *kebele*, do you have access to agricultural extension services? 1) Yes, 2) No

22. If "Yes" how frequent is your contact with the extension agent in a year? _____

23. Do you have access to irrigation? 1) Yes 2) No

24. What source of water do you use for cereal production?

1) Irrigation, 2) rainfied, 3) Both 4) Others_____

25. Is the source of water you use enough for your cereal production? 1) Yes 2) No

## 5. Contribution of onion Production to HH Asset building/ HH food security

26. Please state the amount of income your household obtained in last year 2022/2023

| S/N | Income source category | Estimated income (in Birr) at market price |
|---|---|---|
| 1 | Sale of Onion | |
| 2 | Food crops/Cereal | |
| 3 | Sale of livestock and livestock products( milk, egg, butter) | |
| 4 | Sale of other Vegetable | |
| 5 | Sale of fruits | |
| 6 | Cereal By Product | |
| 7 | Off/non-farm | |
| 8 | Remittance | |
| 9 | Other Specify | |
| | **Total Income** | |

27. Do you have access to non/off-farm activities? 1) Yes, 2) No

28. If yes, what types of non/off-farm activity do you have?

1) Employment 2) Trade 3) daily laborer 4) others

29. In last year your saving deposit habit/experience was?

1) Increased 2) remained the same 3) decreased

30. In last year, do you have any vehicle asset purchased by the income get from sale of onion?

1) Yes 2) No

31. If yes, do you have the following types of vehicles?

Cycle, 1 yes 2. No

Cart, 1 yes 2. No

Bajaj, 1 yes 2. No

Car, 1 yes 2. No

Trucker, 1 yes 2. No

32. In last year, do you have any livestock asset purchased by the income get from sale of onion?

1) Yes 2) No

33. If yes, do you have the following types of livestock?

Ox, 1 yes 2. No yes or no

Cow, 1 yes 2. No yes or no

Donkey, 1 yes 2. No yes or no

Camel, 1 yes 2. No yes or no

Small ruminants, 1 yes 2. No

34. In last year, do you have any asset of house, land and cash deposit purchased by income get from sale of onion?

1) Yes2) No

35. If yes, do you have the following types of assets?

House purchased or constructed, 1 yes 2. No

Land purchased, 1 yes 2. No

Cash deposit/save money, 1 yes 2. No

36. In last year, what about your social participation /eider, marriage, mahber, funeral etc has

1) Increased 2) decreased 3) remained the same

37. In last year, Source of money to cover any educational expenses for children's were

1) Sale of onion2) sale of livestock 3) loan 4) sale of cereals 5) other income sources

38. Source of money to cover the ceremonial expenses

1) Sale of onion 2) sale of livestock 3) loan 4) sale of cereals 5) other income sources

39. Where do you get the money for medical treatment?

1) Sale of onion 2) sale of livestock 3) loan 4) sale of cereals 5) other income sources

40. Source of money for clothing and foot wear

1) Sale of onion 2) sale of livestock 3) loan 4) sale of cereals 5) other income sources

## 6. Household Food Security (Food Production Availability, Ability to Purchase and Utilization), (Household Food Consumption (HFC) Score

41. In last year, did you produce staple food adequate for household consumption Year round?

1) Yes 2) No

42. If' No', how did you fill the food gap?

1) Purchasing from market 2) food aid 3) Food gift from relatives/friends4) purchased and aid

5) Other (specify) _____

43. If you purchase food from market where did you get the money?

1) Sale of onion 2) sale of livestock 3) loan 4) sale of cerals 5) other sources

44. How many number of meals do your household eat a day?

1) One meal 2) Two meal 3) Three meal 4) Four meal

45. How many of the following food groups did your family eat over the course of the last 7 days?

| S/N | Food items | Food group | Weight | Score | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | W*f |
| 1 | Cereals: Corn, Wheat, Sorghum, Rice, Bread Roots and Tubers: | Staples | 2 | | | | | | | | | |
| 2 | Pulses/Beans/ Nuts Pulses | Pulse | 3 | | | | | | | | | |
| 3 | Milk/ Milk Products Milk | Milk | 4 | | | | | | | | | |
| 4 | Animal Proteins: Fish, Meat, Eggs | Meat and Fish | 4 | | | | | | | | | |
| 5 | Vegetables (including green, leafy vegetables) | Vegetables | 1 | | | | | | | | | |
| 6 | Sugar/ Honey | Sugar | 0.5 | | | | | | | | | |
| 7 | Fruits | Fruits | 1 | | | | | | | | | |
| 8 | Oil and Fats | Oil | 0.5 | | | | | | | | | |
| Total | | | | | | | | | | | | |

## 7. Major Opportunities and Challenges or Problems of Onion Production

46. Please identify the major opportunities and challenges or problems of Onion Production in study Area in last year (2022/23)?

**A. Opportunities** _____

_____

_____

**B. Major challenges/Problems** _____

_____

_____

47. Please indicate The Potential Solutions and recommendations regarding to onion production

**A. Solutions**_____

_____

_____

**B. Recommendations**_____

_____

_____

**General Directions for Non- Producers of Sample Households**

Encircle the choice from the options in the space provided for close ended questions and write respondents' responses on the space provided for open-ended questions.

## 1. Supportive Information

- Region : Amhara , Zone: N/wollo , woreda: Kobo town, kebele : 01 kobo zurya

A. Enumerator: _____

B. Date of the interview: _____

C. Interview Number _____

D. Village number_____

## 2. Sample Household Head Profile

1. Sex: 1) Male 2) Female

2. Age: 1) 18-30, 2) 31-60, 3) >61

3. Educational status attained: 1) Illiterate, 2) Grade1-8,3) Grade 9-12, 4) above 12

4. Marital Status: 1) Single, 2) Married, 3) Divorced, 4) Separated, 5) Widow/widower
5. Total farm size in hetar: ---------

6. Total family size: ----------

7. Total number of Ox ----------

**3. Livestock ownership**

8. How many of the following types and numbers of livestock do you have currently?

| No | Livestock type | Number (count) |
|---|---|---|
| 1 | Oxen | |
| 2 | Cow | |
| 3 | Donkey | |
| 4 | Camel | |
| 5 | Poultry | |
| 6 | Goat | |
| 7 | Sheep | |
| 8 | any other (specify) | |
| **Total** | | |

9. Have you sold any livestock in last year? 1) Yes, 2) No

10. Please indicate the number of livestock and their products sold in last year below?

| No | Livestock heads | No./amount sold | value in Birr | Reasons to sold |
|---|---|---|---|---|
| 1 | Calf | | | |
| 2 | Hen | | | |
| 3 | Egg | | | |
| 4 | Goat | | | |
| 5 | Sheep | | | |
| Total | | | | |

## 4. Crop Production

11. What are the major crops produced and income earned in last the year **2022/23**?

| Major Crops | Specified crops | Area in ha | Produced in (Qt) | Consumption In Qt | Seed In Qt | Market In Qt | Saved In Qt | Unit price | Annual income in Birr | Source of water |
|---|---|---|---|---|---|---|---|---|---|---|
| Cereals | Teff | | | | | | | | | |
| | Maize | | | | | | | | | |
| | Sorghum | | | | | | | | | |
| | Wheat | | | | | | | | | |
| Vegetables | Cabbage | | | | | | | | | |
| | Tomato | | | | | | | | | |
| Fruits | Mango | | | | | | | | | |
| | Papaya | | | | | | | | | |
| | Water Melon | | | | | | | | | |
| Pulse | Chickpea | | | | | | | | | |
| | Masho | | | | | | | | | |
| By product | | | | | | | | | | |
| Others specify | | | | | | | | | | |
| Total | | | | | | | | | | |

12. If you faced labor shortage for crop production, how did you solve the problem?

1) Friends and relatives 2) wage labor 3) Debo (Wenfel) 4) Friends, relatives, and wage labor 5) others specify

13. If your answer for question No 12 is 'wage labor', your labor employment trend in last year?

1) Increased2) remained the same3) decreased

14. What is the source of money you paid for wage labor?

1) Sale of cereal crop 2) sale of livestock 3) loan 4) cereal and livestock 5) others specify

15. Do you have Market access? 1) Yes 2) No

16. If yes, where did you sell your cereal products?

1) Local market/Kobo/ 2) Central market 3) abroad 4) others

17. What is your source of market information regarding to cereals?

2) Neighbors, 2) Extension agents, 3) Farmer organizations, 4) Input suppliers,5) Mass Media (TV, Radio, News Papers

18. Do you have access to credit in last year? 1) Yes, 2) No

19. In your *kebele*, do you have access to agricultural extension services? 1) Yes, 2) No

20. If "Yes" how frequent is your contact with the extension agent in a year? _____

21. Do you have access to irrigation? 1) Yes 2) No

22. What source of water do you use for cereal production?

1) Irrigation, 2) rainfied, 3) Both 4) Others_____

23. Is the source of water you use enough for your cereal production? 1) Yes 2) No

## 5. HHs Asset building

24. Please state the amount of income your household obtained in last year 2022/23G.C

| S/N | Income source category | Estimated income (in Birr) at market price |
|---|---|---|
| 1 | Food crops/Cereal | |
| 2 | Sale of livestock and livestock products( milk, egg, butter) | |
| 3 | Sale of other Vegetable/Except onion/ | |
| 4 | Sale of fruits | |
| 5 | Cereal By Product | |
| 6 | Off/non-farm | |
| 7 | Remittance | |
| 8 | Other Specify | |
| **Total Income** | | |

25. Do you have access to non/off-farm activities? 1) Yes, 2) No

26. If yes, what types of non/off-farm activity do you have?

1) Employment 2) Trade 3) daily laborer 4) others

27. In the last two years your saving deposit habit/experience was?

1) Increased 2) remained the same 3) decreased

28. In last year, do you have any vehicle asset purchased by the income get from sale of d/sources?

1) Yes 2) No

29. If yes, do you have the following types of vehicles?

Cycle, 1 yes 2. No

Cart, 1 yes 2. No

Bajaj, 1 yes 2. No

Car, 1 yes 2. No

Trucker, 1 yes 2. No

30. In last year, do you have any livestock asset purchased by the income get from sale of d/t sources? 1) Yes 2) No

31. If yes, do you have the following types of livestock?

Ox, 1 yes 2. No yes or no

Cow, 1 yes 2. No yes or no

Donkey, 1 yes 2. No yes or no

Camel, 1 yes 2. No yes or no

Small ruminants, 1 yes 2. No

32. In last year, do you have any asset of house, land and cash deposit purchased by income get from sale of d/t sources?

1) Yes2) No

33. If yes, do you have the following types of assets?

House purchased or constructed, 1 yes 2. No

Land purchased, 1 yes 2. No

Cash deposit/save money, 1 yes 2. No

34. In last year, what about your social participation /eider, marriage, mahber, funeral etc has

1) Increased 2) decreased 3) remained the same

35. In last year, Source of money to cover any educational expenses for children's were

1) Sale of livestock 2) loan 3) sale of cereals 4) other income sources

36. Source of money to cover the ceremonial expenses

1) Sale of livestock 2) loan 3) sale of cereals 4) other income sources

37. Where do you get the money for medical treatment?

1) Sale of livestock 3) loan 4) sale of cereals 5) other income sources

38. Source of money for clothing and foot wear

1) Sale of livestock 2) loan 3) sale of cereals 4) other income sources

## 6. Household Food Security (Food Production Availability, Ability to Purchase and Utilization), (Household Food Consumption (HFC) Score

39. In last year, did you produce staple food adequate for household consumption Year round?
1) Yes 2) No
40. If' No', how did you fill the food gap?
1) Purchasing from market 2) food aid 3) Food gift from relatives/friends4) purchased and aid 5) other (specify) _____
41. If you purchase food from market where did you get the money?
1) sale of livestock 2) loan 3) sale of cerals 4) other sources
42. How many number of meals do your household eat a day?
1) One meal 2) Two meal 3) Three meal 4) Four meal
43. How many of the following food groups did your family eat over the course of the last 7 days?

| S/N | Food items | Food group | Weight | Score | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | W*f |
| 1 | Cereals: Corn, Wheat, Sorghum, Rice, Bread Roots and Tubers: | Staples | 2 | | | | | | | | | |
| 2 | Pulses/Beans/ Nuts Pulses | Pulse | 3 | | | | | | | | | |
| 3 | Milk/ Milk Products Milk | Milk | 4 | | | | | | | | | |
| 4 | Animal Proteins: Fish, Meat, Eggs | Meat and Fish | 4 | | | | | | | | | |
| 5 | Vegetables (including green, leafy vegetables) | Vegetables | 1 | | | | | | | | | |
| 6 | Sugar/ Honey | Sugar | 0.5 | | | | | | | | | |
| 7 | Fruits | Fruits | 1 | | | | | | | | | |
| 8 | Oil and Fats | Oil | 0.5 | | | | | | | | | |
| Total | | | | | | | | | | | | |

## Check List for Key informant

Sir/Madam, good morning or afternoon,

I am carrying out a study on *The Contribution of smallholder Onion Production to Household Food Security: The case of Kobo town, Amhara, Ethiopia.* Thank you for allowing me to have an interview with you. I want to inform you that, as mentioned in my introduction letter, I will 'respect all ethical research conduct rules.

**General information**

1) Name of the Interviewee: _____ Date: ____/____/2016E.C. ID ____

2) What is the Position of the Interviewee: 1) District, 2) *Kebele*? _____

3) What is the Sex of the interviewee: 1) Male, 2) Female?

4) What is the Profession of the interviewee? _____

5) What is the age of the interviewee in Years? _____

**A) Interview Questions**

- Discussion points with woreda Agriculture and Rural Development office.

1. Major crops grown in the area
2. Availability of credit facility and loan modality
3. Extension service and input provision situations in the area
4. What is the contribution of onion production to HHs food security?
5. Is there a big d/nce b/n producers and non- producers regarding with ensuring food security?
6. Major opportunities and challenges of onion production in the area
7. Indicate solutions and recommendations regarding to onion production

**Guide for Focus Group Discussion**

Sir/Madam, good morning or afternoon,

I am carrying out a study on *The Contribution of smallholder Onion Production to Household Food Security: The case of Kobo town, Amhara, Ethiopia* .Thank you for allowing me to have an interview with you. I want to inform you that, as mentioned in my introduction letter, I will respect all ethical research conduct rules.

**General information**

1) *Kebele* of FGD group: _____ Date: ____/____/2016 E.C.

2) No of discussants: Male_____ Female_____ Total_____. FGD ID: _____

**A) Guide information**

**FGD Checklist**

1. Have you ever produced ONION? If so, what do you know about it?
2. What is the contribution of onion production to HHs food security?
3. Is there a big d/nce b/n producers and non- producers regarding with ensuring food security?
4. Major opportunities and challenges of onion production in the area
5. Indicate solutions and recommendations regarding to onion production

***Thank you!***

Tsehayu Gashaye Abera

Sept, 2024

Kobo