



**FOOD INSECURITY AND ASSOCIATED FACTORS AMONG ADOLESCENTS IN
COFFEE GROWING AREAS OF HAMBELA WAMENA DISTRICT, WEST GUJI,
OROMIA REGION, ETHIOPIA, 2024: A CROSS-SECTIONAL STUDY**

BY

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Abstract

Background: Food insecurity is defined as the condition in which individuals lack sufficient access to safe and nutritious food necessary for an active and healthy life, food insecurity has significant ramifications for dietary quality and overall well-being. In regions where agricultural production is the primary livelihood, such as the coffee-growing areas the implications of food insecurity are particularly pronounced for adolescent populations.

This study aimed to assess the magnitude of food insecurity and associated factors among adolescents in coffee growing areas in Hambela Wamena district, West Guji zone, Oromia, Ethiopia, 2024

Methods: A community based cross sectional study with both quantitative and qualitative data collection was conducted in coffee growing areas of Hambela Wamena district, from July 1 to July 30, 2024. Systematic random sampling technique was used to select 417 study participants. The collected data were entered into EpiData version 3.1 and exported to SPSS version 24 for further analysis. Ordinary logistic regression analysis was performed to identify factors associated with adolescent's food insecurity. Fifteen interviews were conducted with key informants. 15 key informants were transcribed and analyzed.

Results: It has been observed that 239(57.4%) of adolescents were food secure while, 178 (42.6%) of adolescents were food insecure. Sex of adolescents ($p=0.02$), family size ($p<0.001$), sex of household head ($p<0.001$), own farmland ($p<0.001$) and household wealth index ($p<0.001$) were predictors of adolescents food insecurity.

Conclusion: Adolescent food insecurity is prevalent in the study area, significantly linked to family size, household head sex, farm land ownership and socioeconomic status.

Recommendations: Develop and support agricultural training programs aimed at improving farming practices among households, particularly focusing on sustainable coffee farming techniques and diversification of crops.

Keywords: adolescents; food security; stunting; thinness; coffee; Ethiopia

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Tables of Contents

Abstract	iii
Acknowledgements	iv
Tables of Contents.....	v
List of table	vii
List of figure.....	viii
Acronym and Abbreviation.....	ix
Introduction	1
1.1 Background	1
1.2 Statement of the problem	2
1.3 Significance of the study	4
2. Literature review	5
2.1 overviews	5
2.2 Factors associated with adolescent food insecurity	6
2.2.1 Household socio-economic and demographic factors:	6
2.1.2 Household agricultural factors	8
2.1.3 Adolescent socio-demographic factors:	8
3. Conceptual framework	9
4. Objectives.....	10
4.1 General objective	10
4.2 Specific Objectives.....	10
5. Methods and materials	11
5.1 Study area and period.....	11
5.2 Study design	12
5.3 Populations.....	12
5.3.1 Source population.....	12
5.3.2 Study population	12
5.3.3 Inclusion & Exclusion criteria	12
5.3.3.1Inclusion criteria:	12
5.3.3.2 Exclusion criteria	12

5.4 Sample size determination and sampling procedure	12
5.4.1 Sample size determination	12
5.4.2 Sampling technique and procedure	14
5.5 Data collection tools and methods	15
5.6 Data collectors.....	16
5.7 Study Variables	17
5.7.1 Dependent Variable.....	17
5.7.2 Independent variables.....	18
5.8 Operational Definition	18
5.9 Data quality control.....	20
5.10 Data processing and analysis	21
5.11 Ethical Clearance	23
5.12 Dissemination of finding.....	24
6. Results	25
6.1. Description of Socio-demographic characteristics of study participants	25
6.2 Nutritional status of adolescents	27
6.3 Factors Associated With Adolescents Food Insecurity	29
6.4 Qualitative Results	31
6.4.1 Theme One: Financial Understanding	33
6.4.2 Theme Two: Awareness of Food Insecurity	34
6.4.3 Theme three: challenges arising from food insecurity.....	34
6.4.4 Theme four: Dietary diversity	35
6.5 Discussion	36
6.6 Conclusion.....	39
6.7 Recommendations	39
Reference.....	42
Annex-1: Participant Information Sheet and Consent Form for parents/adolescents	45
Annex-2: English Questionnaire	47
Appendix 3: Afan Oromo Version Questionnaire	57

List of table

Table 1: Sample size determination for factors associated with food security among adolescents in coffee producing Kebele in Hambela Wamena district, west Guji zone, Oromia, Ethiopia, 2024.	13
Table 2: Socio-demographic characteristics of study participants in Hambela Wamena District, west Guji zone, Oromia Regional state, Ethiopia, 2024.....	25
Table 3: Factors related to nutritional status of adolescents in Hambela Wamena District, west Guji zone, Oromia Regional state, Ethiopia, 2024.	27
Table 4: Ordinary logistics regression analysis for factors associated with adolescent's food insecurity in Hambela Wamena District, west Guji zone, Oromia regional state, Ethiopia, 2024.	30
Table 5: Number of theme, category and code emerged from the participants to explore adolescent's food insecurity among adolescents of coffee growing areas of Hambela Wamena district, 2024	32

List of figure

Figure 1: conceptual framework of food insecurity among adolescents developed after reviewing relevant literatures(17,25,33)	9
Figure 2: schematic presentation of sampling procedure of Hambela Wamena woreda coffee producer kebeles, West Guji, Oromia, south west Ethiopia February, 2024.....	15
Figure 3 BMI- for age Z-score comparison of WHO reference and adolescent in coffee growing areas of Hambela Wamena District, West Guji zone, ,Ethiopia(n=417),2024.....	28
Figure 4 Height for age Z-score comparison of WHO reference and adolescent in coffee growing areas of Hambela Wamena District, West Guji zone, ,Ethiopia(n=417),2024.....	28
Figure 5 food security status of adolescents in coffee growing areas of Hambela Wamena district, west Guji, Oromia, Ethiopia, 2024	29

Acronyms

AOR	Adjusted Odd Ratio
BMI	Body Mass Index
BMIZ	Body Mass Index for Age
CI	Confidence Interval
DA	Department Of Agriculture
eCHIS	Electronic community Health Information System
FAO	Food and Agriculture Organization
FIE	Food Insecurity Experience Index
FSP	Food Security Package
HAZ	Height for Age
HH	Households
HHS	Household Hunger Scale
HFIAS	Household Food Insecurity Access Scale
HIV/AIDS	Human Immune Virus
IRB	Institutional Review Board
PI	Principal Investigator
SSA	sub-Saharan Africa
SD	Standard Deviation
SU	Salale University
WHO	World Health Organization

1. Introduction

1.1 Background

Food security encompasses food accessibility, availability, safety, quality, and nutrition. Food security is a multifaceted problem with many different definitions. Food security is defined as when all people at all times have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life in the Rome Declaration on World Food Security(1–3).

Whatever the precise meaning of food security may be, hunger is indicated by its opposite, food insecurity. To put it simply, those who experience food insecurity are either at risk of having times of insufficient food or dietary diversity, or they are currently experiencing these situations(2,3). Food insecurity can be caused by catastrophes or systemic shocks, and seasonal food insecurity, a cyclical pattern of insufficient food supply and access, is linked to climate variations, farming patterns, labor demand, markets, and illness, affecting both chronic and transient categories(4,5).

Food security, a global issue, has undergone paradigm shifts over the past 40 years. Initially focusing on supply and production, it has since shifted to entitlement and access issues. The focus has shifted to understanding the risks, solutions, and livelihood complexity of family food security(6).

Food security comprises usage, access, and availability, with access and use measured at household and individual levels. Access is estimated at population level. Household food access is assessed indirectly using techniques like child anthropometry. Measuring short-term shocks on access is challenging(7).

Recent surveys in Ethiopia show that households are experiencing food insecurity, as indicated by the Home (Household) Food Insecurity Access Scale (HFIAS). These qualitative self-assessments are reliable indicators of individual food insecurity in developing nations(8).

For food insecure adolescents, diminished diet quality increases the risks of malnutrition, which is manifested by under nutrition as well as overweight and obesity. Long-term under nutrition is an important cause of stunting. Many boys and girls in developing

countries enter adolescence undernourished, making them more vulnerable to disease and early death(8).

1.2 Statement of the problem

Food insecurity a potential nutrient deficit, can pose a health risk, with extreme forms including famine, hunger, and malnutrition, particularly prevalent in the poor world. The global food insecurity crisis is worsening, with over a billion people affected. Despite media exposure and assistance efforts, food insecurity affects different groups and geographical areas. In the US, uneven resource distribution causes food insecurity, while in developing African nations, scarcity or difficulty obtaining food is the root cause(9,10).

Food insecurity is prevalent globally, particularly in sub-Saharan Africa and Asia, where export-oriented trade balances and limited access to food imports lead to smallholder farmers dividing resources. Similarly, much of the population in Sub-Saharan Africa, particularly in rural areas, experiences some degree of hunger over the rainy or hungry season, when food stocks dwindle and roads become muddy and impassable(11). More than one billion people worldwide experience some level of food insecurity(12).

Small-scale coffee growers have financial difficulties due to their small land holdings, large capital expenditures, and unstable global coffee prices. (13). These and other factors limit smallholders flexibility for making adjustments towards more productive or profitable crops, leaving them with insufficient cash resources to purchase food and limited land and or time to dedicate to cultivation of food crops(14–16).

Food insecurity continues to form a deep seated problem in several sub-Saharan African (SSA) countries(15). A recent Food and Agriculture Organization of the United Nations (FAO) report indicates that the number of undernourished people in Africa still remain high at 226.7 million. Even now, countries in the Horn of African are overwhelmed by heightened food security crises, making the problem of food security an issue of great concern to governments and the international community (17).

Food insecurity in developing countries has extremely serious consequences. It leads to individuals who are vulnerable meaning that they are more exposed to and sensitive to livelihood shocks(18). Food insecurity often results in hunger and malnutrition, which in turn lead to reduced school attendance and learning capacity for children, less education and employment for women and girls, weakened immune systems, rising child mortality, impaired maternal and infant health, risky survival strategies, spread of HIV/AIDS, malaria and other diseases, unsustainable use of natural resources and reduced capacity to access markets and resources(18–20).

Ethiopia is one of the least developed countries in the world according to all measures of poverty. The 2012-2014 FAO assessment report estimated 32.9 million of the Ethiopian people are undernourished, indicating food shortage as an on-going problem in the country(16,20,21). The causes of food insecurity problems in Ethiopia are complex and interrelated. Lack of governance and misdirected economic policies during the military regime, unfavorable weather fluctuations, high dependency on rain fed agriculture, and failure to bring about economic transformation have all contributed negatively to the country's agricultural performance in past decades. Declining soil fertility, land degradation, and shrinking landholding due to population pressure had contributed to the deterioration food production(14,22).

Adolescence is when people are supposed to undertake a number of significant transformations into adulthood. The state of nutrition also plays a role in several of these important shifts. Unsecured food availability can affect a person's ability to attend and perform well in school, make reproductive decisions, migrate, find work, and maintain general health and wellbeing(17,23,24).

Whilst pervasive food insecurity exists among adolescents in Ethiopia, the available information is scant and inconsistent(4,25,26). Therefore, the main objective of this cross-sectional study is to contribute to these gaps by assessing the food security of adolescents in the selected coffee-growing areas.

In this study, the aim is to contribute to the understanding of food insecurity in West Guji zone Hambela Wamena Woreda coffee producing Kebele by investigating adolescent food insecurity.

1.3 Significance of the study

Food instability affects adolescent development and can result in sadness, stress, anxiety, and malnutrition. This can have an impact on coffee farming, a major economic activity, restricting job prospects, education, and production. Adolescents who experience food insecurity are less likely to focus and do well in school, which lowers their educational achievement. Increased absenteeism due to hunger can further impact academic performance and future prospects

The study can reveal how community resources and support systems influence food security among adolescents, which is crucial for community-based interventions. Understanding local perceptions of food and nutrition can inform culturally appropriate solutions to address food insecurity.

Addressing food insecurity can empower adolescents to play active roles in their communities, promoting resilience and social cohesion. Tackling food insecurity in youth may lead to long-term improvements in community health and economic stability, benefiting future generations

The aim of this study was to assess the prevalence of adolescent food security in coffee producing kebeles. The results of this study will help health authorities and other concerned bodies to design relevant adolescent food insecurity prevention and control measures to ensure healthy growth and good nutrition of the study area.

2. Literature review

2.1 overviews

The global food insecurity crisis is worsening, with over a billion people affected. Despite media exposure and assistance efforts, food insecurity affects different groups and geographical areas. In the US, uneven resource distribution causes food insecurity, while in developing African nations, scarcity or difficulty obtaining food is the root cause(27).

While it is not as bad as in less developed nations, food insecurity is nevertheless a concern in the United States, where 11% of the population experienced food insecurity. Furthermore, of those, (4%) had extremely low food security, which is defined as reducing the food intake of one or more adults and disrupting their eating patterns at times during the year because the household lacked money and other resources for food(28).

Study done in Nigeria, 43% of the sampled homes had enough food, compared to 57% who did not have enough food. In a study carried out in the Pico Duarte Coffee Region of the Dominican Republic, 32 (76%) of the 42 respondents reported experiencing food insecurity annually (4,5,29).

There are several factors that affect food insecurity. Different studies show the determinants of food insecurity in various parts of Ethiopia. Study conducted in Gode district, Shebelle zone of Somali region show that family size, annual income, livestock holding, livestock disease, livestock feed, and dependency ratio are the major determinants of food insecurity, from those family size, livestock disease and dependency ratio are positively related to food insecurity, while the remaining are negatively related(15,16).

According to a survey done in Addis Ababa, food insecurity is prevalent among people over 45. Study done in Jima reveal that 60% of adolescents are found to be food insecure whereas prevalence of household food insecurity is 75%. Study done in Hararghe indicates that the age of the household head, family size, access to irrigation, adoption of soil and water conservation, size of cultivated land, and received credit are all significant in determining vulnerability to food insecurity(17,22).

Adolescents living in food insecure households have been associated with poorer health status and diet quality compared to those living in food secure households. Furthermore, the risk of malnutrition and certain chronic diseases can increase with an increasing level of food insecurity, which is linked to diets that may be less than optimal. This is specific to the urban poor as limited household resources for food may shift their diet composition and diversity. People who are food insecure are more likely to purchase food that is less nutritious and high in salt, sugar and fat(7).

2.2 Factors associated with adolescent food insecurity

2.2.1 Household socio-economic and demographic factors:

Households that score lower in terms of socio-economic status tend to consume more unhealthy food products and fewer healthier ones compared to households with a higher socio-economic status score. In particular, research has found higher consumption of fast food and soft drinks and lower intake of fruit and vegetables, as well as a higher likelihood of skipping breakfast. Households that score lower in terms of socio-economic status also tend to consume less vegetable protein, dietary fiber, and micronutrients(28).

Households that score lower on their socio-economic status tend to consume more processed foods whereas more educated, wealthy and less disadvantaged households spend a smaller proportion of their total household food budget on processed foods in general. As incomes rise, the basket of food products purchased by household's changes. Studies conducted at the household level show that higher incomes are associated with greater purchases of vegetables and fruit, low-fat milk, and high-fiber food(30).

The fact that 40% of households headed by women and 61.4% of households headed by men had food security. There is a higher percentage of food-secure households in households headed by men than by women. The proportion of food-secure households continues to decline while household size is rising. The state of food security in a home is therefore determined by its size. The percentages of households where the head of the home earns more money each month rise together with(31).

Food security within a home is influenced by the source of income, as research indicates that "lump-sum" forms of income, including cash crop payments or remittances, are less

likely to be used to increase food security within a household. Rather, non-food goods are purchased with the money. Therefore, income control is another factor(6).

Adolescent females (15.9%) are substantially more likely than boys (11.1%) to experience chronic food insecurity. In comparison to 8.3% of adolescents living in food secure families, a larger percentage (22.6%) of adolescents belonging to food insecure households during the initial round of the survey has chronic food insecurity. Adolescents who have only completed primary school had double the likelihood of experiencing chronic food insecurity (14.4 vs. 7.0%) as those who have completed secondary school or higher(20).

Additionally, a greater percentage of teenagers living in households headed by women than in men are found to be chronically food insecure (17.5% vs. 13.2%). Teens with chronic food insecurity are more likely to have illiterate parents and mothers than those whose parents are literate(32)

According to the study done in Addis Ababa among the total 550 households, 412 (74.9%) reported scores that classified them as food insecure. According to the scale, 128 (23.3%) of households are classified as severely food insecure, while 113 (20.5%) and 171(31.1%) households are mild and moderately food insecure respectively(33)

Studies conducted in Kersa District, East Hararghe region of Ethiopia shows that age of the household head, use of improved seed and adult equivalent have negative effect and statistically significant factor for food insecurity; whereas, land size in hectare and number of livestock in tropical livestock unit negatively affect food insecurity of households. Educational status of household head, family size, use of farm input and number of oxen owned by households were determinants of food insecurity(8).

The affordability of food (which depends on incomes and food prices) influences consumer food choices. Income in particular appears to play a bigger role than education and occupation as a predictor of food choice(34)

A study carried out in Sidama zone indicates that household heads who are uneducated daily Laborers and government employees are more likely to have higher food insecurity. It shows that 54.1% of households experience food insecurity and 28.8% of those

households experience mild to severe household hunger for a prolonged period of time over the course of a year(3)

2.1.2 Household agricultural factors

Studies conducted in Jigjiga District of Ethiopia, shows that use of fertilizer by farming households, total household income, access to veterinary services and access to extension services is found to have a positive and significant impact on household food security; whereas, the agro ecology stratum in which the household's farmland is located found to have a negative and statistically significant impact on food security(19)

The most significant factors influencing the state of food security and having a positive impact on the probability of being food secure are found to be cultivated land size, frequency of extension visits, access to credit, access to farm plus off-farm activities, safety net aid, use of chemical fertilizer, cooperative membership, and agro-ecological zone. A study conducted in Laelaymachew woreda, central zone of Tigri, found that for every hector increase in the overall cultivable land holding area, the probability of being food secure improves by a factor of 1.001(5).

2.1.3 Adolescent socio-demographic factors:

Food choices are determined by a wide range of factors, including availability, cost, preferences, and habits which in turn are related to socio-economic and demographic factors. Food choices in adulthood are also shaped in part by food experiences encountered when growing up, highlighting the role of consumers' backgrounds during childhood on future food choices(25)

Food consumed away from home accounts for a growing share of the food budget. As countries develop and become increasingly urbanized, the importance of food away from home grows. Lacks of cooking skills and confidence have been identified as contributors to a decrease in home cooking and barriers to healthy eating(35).

3. Conceptual framework

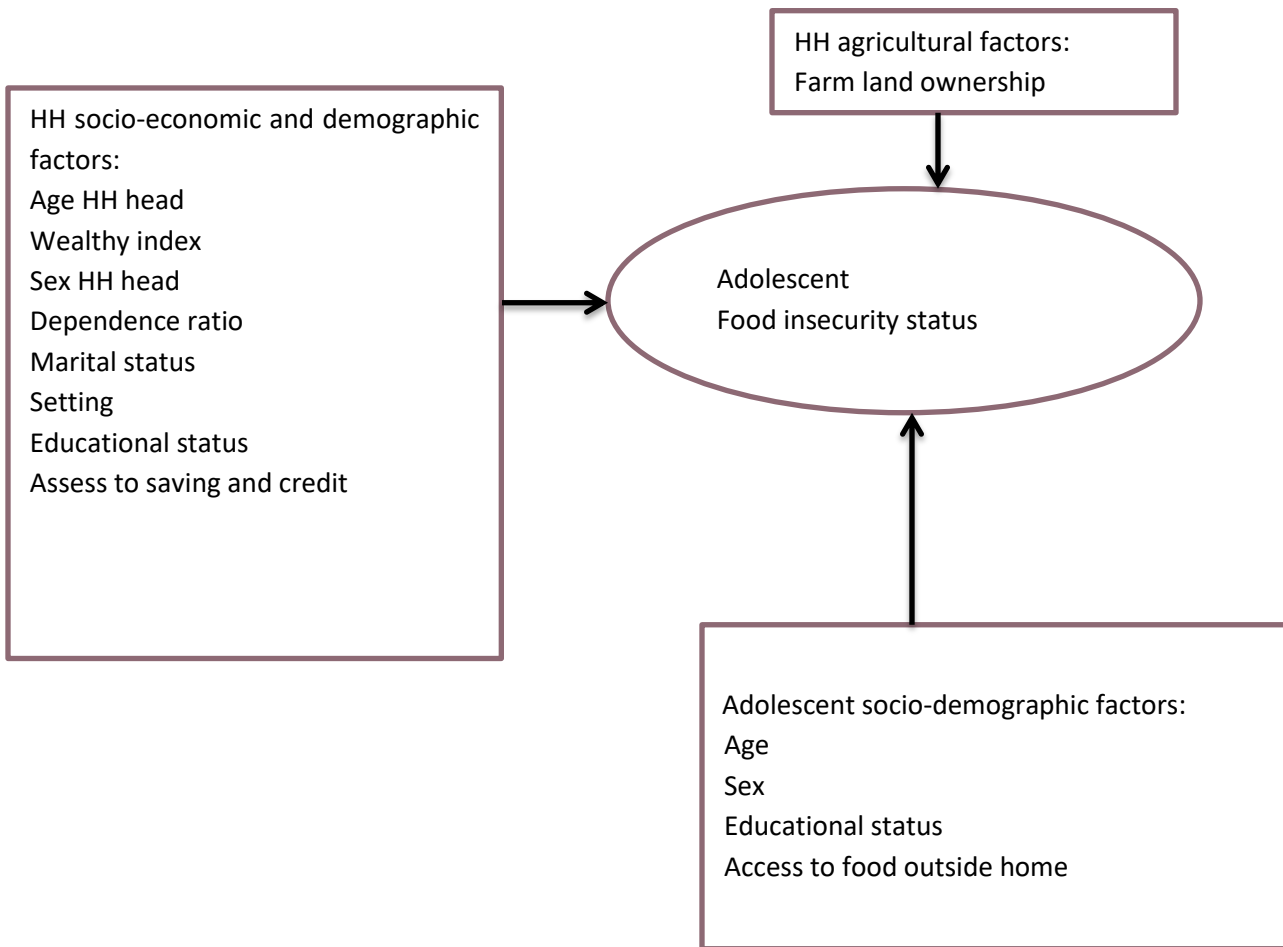


Figure 1: conceptual framework of food insecurity among adolescents developed after reviewing relevant literatures(17,26,33)

4. Objectives

4.1 General objective

To assess prevalence of food insecurity and its associated factors among adolescents in coffee growing areas in Hambela Wamena district, West Guji zone, Oromia, Ethiopia, 2024.

4.2 Specific Objectives

To determine the prevalence of food insecurity among adolescents in coffee producing Kebele in Hambela Wamena district, West Guji zone, Oromia, Ethiopia, 2024.

To identify factors associated with food insecurity among adolescents in coffee producing Kebele in Hambela Wamena district, West Guji zone, Oromia, Ethiopia, 2024.

To explore the challenges of food insecurity among adolescents in coffee producing Kebele in Hambela Wamena district, West Guji zone, Oromia, Ethiopia, 2024.

5. Methods and materials

5.1 Study area and period

This study was conducted in coffee-producing Kebele in Hambela Wamena woreda, West Guji Zone, Oromia region, southwestern Ethiopia. Out of the ten coffee-producing kebeles study was conducted in three Kebele namely Danse Sayisa, Buku Sayisa, and Benti Nenka. Hambela Wamena is one of the 10 districts in west Guji zone, Oromia Regional State and located at 482km away from the capital city of Ethiopia, Addis Ababa to the North and 54km from the Capital of West Guji zone, Bule Hora to the West. The Main town of the woreda is Dimtu. The district is Geographically Bordered by: Haro Wolabu district in North, Shakiso district in East, Gedeo Zone in the west and Kercha district south direction. The Climate condition of the district is Highland (Dega) with annual rain fall 1200 mm.

The total population of the district as projected from 2007/2008 census is about 259,064 from which 132,264(51.06%) are males, and 126,799(48.95%) are females. According to data obtained from the district health office, there are 53,972 households in the districts with different target groups (under one-year infants = 8334, under five-year children =42567, pregnant women = 8990, non-pregnant women = 48,264 and 28,601 adolescents) (Hambela Wamena woreda Health office, 2023).

Different ethnic groups; Oromo, Gedeo, Amhara, Gurage, etc. live in the district. Religious followers like Muslims, Orthodox, and Protestants live in the district. There are different government and private organizations and institutions in districts. The district is well known for inset and Coffee production. Hambela Wamena district has five health Centers (Governmental), 30 Health posts, and 30 private clinics providing health services for the communities. In these areas, the main source of income depended on coffee production, leading to malnutrition among vulnerable groups including adolescents. In these areas, many households faced reduced food availability during poor coffee harvest. For this reason, we are interested in undertaking this study on coffee-producing kebeles.

The study was conducted from July 1 to 30, 2024.

5.2 Study design

A community-based cross-sectional study was conducted using mixed data collection methods..

5.3 Populations

5.3.1 Source population

Adolescents aged 10-19 years living in the coffee producing Kebele in Hambela Wamena woreda.

5.3.2 Study population

Quantitative: Adolescents living in households in randomly selected from three coffee-producing Kebele and live in the kebeles more than six months.

Qualitative: key informants (KII) were conducted with participants who were selected through purposive sampling method. Fifteen (15) key informants such as DA (department of agriculture), health extension workers, adolescents' families, Kebeles' leaders, woreda health and agricultural office were selected because of their working experience, vulnerability to food insecurity and knowledge on the topic.

5.3.3 Inclusion & Exclusion criteria

5.3.3.1 Inclusion criteria:

Adolescents aged 10-19 years, not pregnant and live in the kebeles for more than six months.

5.3.3.2 Exclusion criteria

A parent and adolescent who have mentally and Critically ill during data collection was not included in the study.

5.4 Sample size determination and sampling procedure

5.4.1 Sample size determination

The sample size was determined by using single population proportion formula with the following assumptions: the expected prevalence of food insecurity of adolescents was 38% (from Sidama zone), confidence level of 95% and 5% degree of precision.

Where p =proportion of food insecurity of adolescents (38%) =0.38

$Q=1-P=0.62$

$D=0.05$ (marginal error)

$Z_{\alpha/2}=95\%$ confidence interval (1.96)

10% of non-response rate= $362 \times 0.1=63$

Total sample size is=425

The sample size determination for the second objective was calculated using Epi info version 7.2.6 with the associated variables in the table 1 below.

Table 1: Sample size determination for factors associated with food security among adolescents in coffee producing Kebele in Hambela Wamena district, west Guji zone, Oromia, Ethiopia, 2024.

Associated Factors	Prevalence of food insecurity		Calculated Sample sizes	Calculated sample size when 10% is added,		References
	Exposed	Non exposed				
Mother Education status	Unable to read and write (41.6%)	Able to read and write (22.2%)	200	220		(33)
Family size	Family size (4-6) (27.7%)	Family size (<3) (11.3%)	206	227		(26)
Frequency of meals / day	<3times (25.8%)	> 3 times (12.1%)	284	312		(36)

Since the calculated sample size for the second objective was less than calculated sample size for the first objective the final sample size for this study was 425.

Total sample size were=425

For qualitative: sample size was determined by idea saturation in case of in-depth interview and totally 6 in-depth interviews were conducted.

5.4.2 Sampling technique and procedure

First we selected Hambela Wamena district based on different literatures and personal experience. From personal experience many farmers in coffee growing areas focused predominantly on coffee production as cash crop which limits the diversity of food and many of children experience malnutrition. Second we selected ten kebeles in the district in consultation with woreda level experts and Kebele level DA due to its increasing potential coffee production.

Then numbers of households were selected from 3 kebeles by the help of electronic community health information system (eCHIS) and women development army (WDA). Out of the 10 coffee producing kebeles in Hambela Wamena woreda, 3 kebeles were selected by simple random sampling techniques. The sample was allocated proportionally to each selected Kebele based on their respective adolescent's 10-19 years.

Then sampling frame consisting household number was prepared from electronic community health information systems of respective Kebele. In households with more than one adolescent only one adolescent was selected randomly. After calculating the sample size interval k is calculated and the result is 8 (since the sample proportionally allocated the value of k is similar for all selected Kebele). Then every nine households in the selected Kebele was included in the study. The first household was identified by simple random sampling using lottery method.

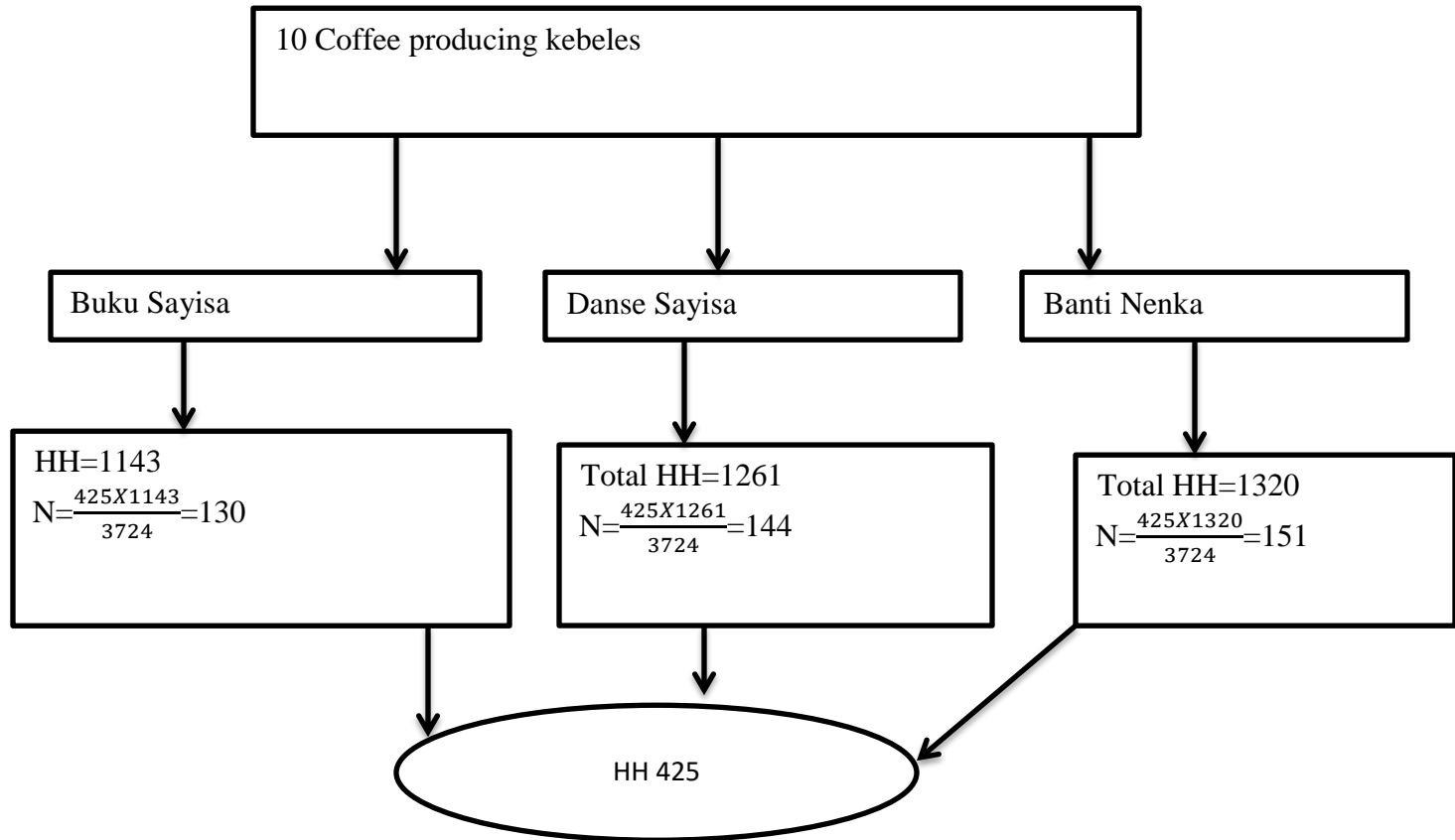


Figure 2: schematic presentation of sampling procedure of Hambela Wamena woreda coffee producer kebeles, West Guji, Oromia, south west Ethiopia February, 2024

5.5 Data collection tools and techniques

A structured interviewer administered questionnaire was adopted from relevant literatures and previous studies(26,37). The questionnaire was first prepared in English and translated into Afan Oromo local language by language experts to make sure that the questions are clear and was understood by the respondents, and then it was translated back to English version to maintain its consistency.

The questionnaire consisting of five sections: socio-demographic and economic factors, household wealthy index, four weeks household food insecurity access scale, dietary diversity and anthropometric measurements. Four clinical nurses who were able to communicate in Afaan Oromoo were recruited from health centers in the district for data

collection. Two health officers were also recruited for supervision. Then a face-to-face interview was conducted with the adolescents to fill out the questionnaire.

The basic profiles of the adolescents including age in months and recorded their weight and height with standard procedures were collected. A height measurement was done using a wooden height measuring board with a sliding head bar. The respondents were asked to stand straight on the leveled surface with heels together and their heads positioned and eyes looking straight ahead (Frankfort plane) without shoes. Heels, buttocks, shoulder blades should touch the vertical surface of the Stadio meter. The moving headpiece of the Stadio meter was applied to lower to rest flat on the top of the head and read to the nearest 0.1cm. The weight was measured using an electronic digital weight scale with light clothing and without shoes and then record to the nearest 0.1kg. Calibration was done before every weight measurement, the data collectors assure the scales reading exactly at zero. Height and weight was measured twice and the average value was used for analysis.

We instructed each respondent to think about his/her personal experience, not that of his/her household or family, and asked him/her if, in the last one month, he/she had ever:

- ✓ Worried about having enough food
- ✓ Had to reduce food intake because of shortages of food or money to buy food;
- ✓ Had to go without eating because of shortages of food or money to buy food;
- ✓ Had to ask outside the home for food because of shortages of food or money to buy food.
- ✓ Spend all day without food
- ✓ Had eaten limited variety of food because of shortage of food or money to buy food
- ✓ Had eaten fewer meals a day because there was not enough food and
- ✓ Did you go to sleep at night hungry because there was not enough food

We were coded the yes responses one (1) and the no responses zero (0), summed up the scores, and produced Household Food Insecurity Access Scale (HFIAS).The HFIAS question was used to measure food insecurity, a tool that has been developed by FAO and FANTA and validated for developing country(33). The HFIAS consists of 9 items

specific to an experience of food insecurity occurring within the previous four weeks. Each respondent was indicating whether they had encountered the items due to lack of food or money to buy food in the last one month. Endorsed a standard scoring procedure was used with 1 point for occurrence and 0 for non-occurrence. The frequency scores were ranged from 0 to 3, while 0 was the score for non-occurrence, 1 for rarely (once or twice in the past four weeks), 2 for sometimes (three to ten times in the past four weeks), and 3 for often (more than ten times in the past four weeks)(36).

Concerning the dietary diversity, individual was asked about their past 24-h dietary recall method (from sunrise to sunrise), while for the dietary food frequency, individual was asked about their past 7 days of food frequency practice using the WHO nine food groups. The minimum dietary diversity score of four or more out of the nine groups of foods were considered as adequate(17).

Qualitative data collection was conducted through open ended checklist for in-depth interviews. Two health workers who have minimum diploma in health were collect data from key informants. During interviews and discussion, tape recording and note-taking was done to prevent data loss and capture information.

Face-to-face interviews were conducted in a quiet room where participants feel free. During interview, the interviewees were asked questions, followed by probes until saturation of idea is reached. The assistant data collectors were audio-record the interviews for 15-25 minutes and the principal investigator was moderate and take notes to capture the original responses of the participants. An interview was commenced by using two digital recorders in which one will be used as a back-up. A note was taken as a back-up in case audio recordings failed or inaudible. Data collectors were review the collected data throughout the study.

5.6 Study Variables

5.6.1 Dependent Variable

Adolescent food insecurity status

5.6.2 Independent variables

- ✓ HH Socio-economic and demographic factors: Age of household head, age of spouse, sex of household head, marital status, dependency ratio, total expenditure for food, access to saving and credit, wealth and setting.
- ✓ HH Agricultural related factors: Farm land ownership, use of agricultural input (fertilizer, improved seed, insecticide and pesticide), use of agricultural extension service.
- ✓ Adolescent Socio-economic and demographic factors: age, sex, educational status and access to food outside home.

5.7 Operational Definition

Adolescent food insecurity: according to the household food insecurity access scale adolescents with score of 2 and above were categorized as food insecure (26).

Food secure Adolescent: According to the household food insecurity access scale adolescents with score of 0-1 or experiences none of the food insecurity (access) conditions, or just experiences worry, but rarely (23,26).

A mildly food-insecure adolescent: According to the household food insecurity access scale adolescents with score of 2-4 or worries about not having enough food sometimes or often, and/or is unable to eat preferred foods, and/or eats a more monotonous diet than desired and/or some foods considered undesirable, but only rarely. But it does not cut back on quantity nor experience any of three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating)(23,26).

A moderately food-insecure adolescent: According to the household food insecurity access scale adolescents with score of 5-8 or sacrifices quality more frequently, by eating a monotonous diet or undesirable foods sometimes or often, and/or has started to cut back on quantity by reducing the size of meals or number of meals, rarely or sometimes. But it does not experience any of the three most severe conditions(23,26).

A severely food-insecure adolescent: According to the household food insecurity access scale adolescents with score of 9 and above or has graduated to cutting back on meal size or number of meals often, and/or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating), even as infrequently as rarely. In other words, any adolescent that experiences one of these three conditions even once in the last four weeks (30 days)(23,26).

Adolescent: age group 10-19 based on WHO definition

Household food insecurity: if the family experiences any of the conditions (uncertainty, insufficient quality and quantity of food) within the recall period. (If the answer to any of the questions is rarely, sometimes, or often. The only exception was among households in which the respondent's answer to question 1 was "rarely" but the response to all the other questions was never) (23,26)

Household: Refers to group of persons who live together as a unit and sharing from the same dietary pot on a regular basis.

Household dependency ratio: the ratio of people who are potentially expected to be nonproductive (age groups greater than 64 and less than 15 years) to people who are expected to be potentially productive (age 15-64 years)(23,26).

Thinness - is defined as BMI for age below <-2 Z-score of the 2007 WHO standard reference values

Stunting- is the height for age z-score (HAZ) of $<- 2$ SD on the WHO growth reference cut-off point.

Body Mass Index (BMI):- A measure for indicating nutritional status and an accepted measure of adiposity. BMI was calculated as weight in kilograms divided by square of height in meters

Dietary Diversity Score: was the list of foods consumed within the last 24 h and was categorized as low (≤ 3 food groups), medium (4 and 5 food groups) and high dietary diversity score (≥ 6 food groups)(8).

Wealth index: Households are given scores based on the number and kinds of consumer goods they own, ownership of the house and land, cattle and in addition to housing characteristics such as source of drinking water, toilet facilities, and flooring materials. These scores are derived using principal component analysis. National wealth quintiles are compiled by assigning the HHs score to each usual HHs member, ranking each person in the HHs population by her or his score, and then dividing the distribution into 3 equal categories(37).

5.8 Data quality control

To ensure the quality of data the questionnaire which initially prepared in English was translated to Afan Oromo and then back translated to English to check for consistency by two different language experts.

Four diploma nurses who are fluent speakers of the local language were recruited and collected the data, considering prior experience of participation in anthropometric data collection and two B.Sc. public health officers supervised the data collection. Both the data collectors and supervisor received training for two consecutive days on the objective, relevance of the study, confidentiality of information, respondent's right, informed consent and techniques of interview on survey. The training also gave detail description on data collection instrument.

Questionnaires were checked for completeness every night at the time of data collection and incomplete ones was sent back to the data collector for checkup under supervision. During data collection, meeting was held between data collectors and the principal investigator to discuss practical problems. All data collectors were supervised regularly and constant communication was maintained throughout the study period.

The scale was calibrated to zero every measurement of weight. The data was strictly checked for completeness, accuracy, clarity and consistency by supervisors on daily bases. Furthermore, the data was checked for completeness, coded and carefully entered into computer using Epi-data version 3.1 and data cleaning was done before analysis.

For qualitative data, first the key informant guides were prepared in English and then translated into Afaan Oromoo in order to ensure its consistency. The authenticity and accuracy of qualitative data was checked by one qualitative data analyst through

reviewing transcriptions from audio recordings, translations and coding. Four basic criteria of qualitative study were kept to ensure trustworthiness as follows;

Credibility: prior to data collection, the principal investigator was made a good environment where participants are advised to stay open and refresh during the interview.

Dependability: an interview document was coded twice in different times by investigator to check for the similarity of the codes for intra coder dependability.

Transferability: to ensure transferability the research situation and methods were describe in detail for more understanding of the study to other researchers.

Conformability: To ensure conformability, during interview notes were taken, audio-recorded and data was coded, categorized and form theme.

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5.9 Data processing and analysis

Quantitative: Before data entry and cleaning, the data was checked manually for completeness and consistency. Data was coded and entered into Epi-Data version 3.1 and exported to SPSS version 24 for analysis.

Data coding, cleaning was done manually and entry was done using Epi Data 3.1 version and then exported to SPSS version 24 for analysis. Frequencies and percentages of variables were produced and presented in table and graph and household wealthy index income was measured.

We checked the distribution of the data and calculated the Z-scores for the height for age (HAZ) and the body mass index for age (BMIZ) using the WHO AnthroPlus software (an open software freely available from the World Health Organization website). We determined the nutritional status of the adolescents using the WHO 2007 growth standards. Accordingly, using the height for age Z scores, we categorized them into three classes of stunting, i.e., non-stunted ($HAZ > -2 SD$), moderately stunted ($HAZ < -2 SD$), and severely stunted ($HAZ < -3 SD$). Similarly, using the BMIZ, we categorized them into thin ($BMIZ < -2 SD$), severely thin ($BMIZ < -3 SD$), overweight ($BMIZ > 1 SD$), and obese ($BMIZ > 2 SD$).

Principal component analysis (PCA) was used to generate wealth index. Non-productive assets (radio, sleeping room and motorcycle), household utilities (toilet, flooring, wall material, roof, and cooking fuel), and other assets (land ownership, oxen, others cattle, sheep, donkey and poultry) were selected for analysis in SPSS. Then, a principal component analysis (PCA) was conducted with all the selected variables. For constructing the wealth index, the principal component (the first factor score) was taken to represent the household's wealth. By the rule of thumb if the variables were owned by more than 95% or less than 5% of the sample it should be excluded from the analysis. Based on PCA, the results of household wealth status/index was converted into tertiles and categorized into higher/rich, medium, and lower/poor tertiles.

Descriptive statistics was done to show the magnitude of adolescent food insecurity and participant characteristics. Ordinal logistic regression technique was used to analyze the relationship between ordinal dependent variables and one or more independent variables. Model goodness-of-fit test was done by using the Pearson test statistic to find out whether the model with the independent variable is a suitable model and there was significant improvement in fit as compared the null model (the model adequately fit the data) ($p > 0.05$). Test of parallel line was done and it showed that the effect of independent variables were the same across the levels of dependent variables ($p = 0.09$). Regarding pseudo R-square there has been 84.1% improvement in the prediction of outcome variable based on the predictors in comparison to the null model.

Associations between dependent and independent variables were checked using ordinary logistic regression analysis. Before inclusion of predictor variables, multi-collinearity was checked among selected variables by using cut-off point of VIF less than 10 (the maximum VIF for the variables included in this study was 1.46) and tolerance test (≥ 0.10). To identify the presence of multi-collinearity the tolerance value and variance inflation factors of each independent variable was tested and the test result showed that all independent variables in the study had tolerance value > 0.1 and variance inflation factors < 10 . It concludes that there was no multi-collinearity in the model.

Odds ratio was calculated on some selected variables to determine the association between the outcome and selected variables through ordinary logistic regression.

Ordinary logistics regression analysis was done using enter methods to identify factors associated with adolescents food insecurity. Independent variables with p-value less than 0.25 were candidate for ordinary logistic regression analysis. On the ordinary logistic regression analysis adolescent's food insecurity had statistical association with eight (8) factors. Statistical significance was declared at p-value <0.05. Normality of the data was assessed visually using a P-P plot for all numerical variables. All variables were normally distributed and there was no need of transformation.

Qualitative data analysis was performed manually using inductive thematic analysis, which aimed to identify a set of main themes that captured the diverse views expressed by participants. The audio recording and notes taken from KII were transcribed verbatim. Then the transcript was translated from the local language (Afaan Oromo) into English. The translated transcript data was arranged thematically. Thematic analysis was used to arrange the qualitative data, and expanded field notes from different participant's perspectives manually. Finally, the concept was narrated and triangulate with the finding of the quantitative findings

5.10 Ethical Clearance

Ethical approval was obtained from Institutional Review board (IRB) of Salale University Ref.No: SIU-IRERC-137/2016, a written permission letter was obtained from West Guji zonal Agriculture Department, West Guji zonal Health department and Respective district Offices. For respondents less than 18 years old assent/consent was obtained from their parents or care givers and assents from the adolescents. The aim of the study and the procedures were explained to the adolescents in private before interview and anthropometry measurements. Moreover, they were informed that they were having the right to withdraw from the study at any stage of the data acquisition. They were assured that the data they provided was kept confidential and no any adolescent identifying attributes were encoded and reported in any report

5.11 Dissemination of finding

The findings of this study was disseminated to Salale University, college of health science department of public health, West Guji zonal Agricultural office, Hambela Wamena woreda Agriculture office and Woreda Health office and other concerned bodies of governmental and nongovernmental in the study area through reports and publication on reputable journal.

6. Results

6.1. Description of Socio-demographic characteristics of study participants

A total of 417 adolescents participated in the study giving a response rate of 98%. From the total of 417 adolescents more than half 217 (52%) were males while the mean age of adolescents was 13.71 (SD=1.94). More than half of adolescent families had a family size greater than five 227 (54.4%) followed by family sizes between three and five 173 (41.4%) and the mean household family size was 7.65(SD=5.19). More than half of respondent's religion was Protestant 267(64%) followed by Orthodox 78(18.8%). The highest ethnic groups of respondents were Oromo 367(88%) followed by Gedeo 44(10.6%). Regarding the marital status of respondents all of them were single 417(100%) (Table: 2)

Regarding educational status of fathers 107 (25.6%) were unable to read and write, 78(18.6%) of them were read and write, 122 (29.2%) of them were primary school and 57 (13.6%) of them were secondary school, 54(12.9%) were college and above. Regarding educational status of mothers more than half 247(59.3%) were unable to read and write followed by primary school 91(21.9%).It has been observed that illiteracy was higher among mothers 247(59.3%) of respondents compared to fathers 107(25.6%)(Table:2)

Regarding occupational status of father 28(6.6%) were merchant, 52(12.5%) of them were government employed and 337(80%) of them were farmers. Majority 377(90%) of households had their own land for farm. 323(77.4%) of households were headed by males. Concerning household's wealth 189(45.2%), 134(32.2%) and 94(22.2%) households had low, medium and high wealth index respectively (Table: 2).

Table 2 Socio-demographic characteristics of study participants in Hambela Wamena District, west Guji zone, Oromia Regional state, Ethiopia, 2024

Socio-demographic variables		Frequency	Percentage
Sex of respondents	Males	217	52
	Females	200	48
Sex of household heads	Males	323	77.4
	Females	94	22.6
Age of respondents	10-13 years	213	51.1
	14-16 years	168	40.2
	17-19 years	36	8.7
Family size	<3	18	4.2
	3-5	173	41.4
	>5	227	54.4
Religion	Muslim	50	12
	Orthodox	78	18.8
Ethnicity	Catholic	7	1.6
	Protestant	267	64
	Wakefata	15	3.5
	Oromo	367	88
	Amhara	6	1.4
	Gedeo	44	10.6
Father education	Illiterate	107	25.6
	Read and write	78	18.6
	Primary school(1-8)	122	29.2
	High school(9-12)	57	13.6
Mother education	College and above	54	12.9
	Illiterate	247	59.3
	Read and write	31	7.5
	Primary school(1-8)	91	21.9
Occupation of fathers	High school(9-12)	18	4.2
	College and above	30	7.1
	Merchant	28	6.6%
	Government employed	52	12.5
Own land for farm	Farmers	337	80.9
	Yes	377	90.4
	No	40	9.6
Wealth index	Low	189	45.2
	Medium	134	32.2
	High	94	22.6

6.2 Nutritional status of adolescents

From the total adolescents involved in the study most of adolescents 409(98.1%) reported that they have consumed cereal and tubers while eggs 62(14.8%), milk and milk products 73(17.6%), and fruit and vegetables 77(18.4%) were the least eaten food by adolescents. Individual dietary diversity score was calculated to measure the food adequacy and nutrient intake of adolescents. It has been observed that 67(16.2%) of adolescents had higher individual dietary diversity scores. Low and medium individual dietary diversity score was 162 (38.6%) and 188(45.2%) respectively (Table: 3).

Table: 3: nutritional status of adolescents in Hambela Wamena District, west Guji zone, Oromia Regional state, Ethiopia, 2024.

		frequency	Percentage
Dietary score	Low	162	38.6
	Medium	188	45.2
	High	67	16.2
24 hours dietary diversity recall	Cereal and tubes	409	98.1
	Eggs	62	14.8
	Fruit and vegetables	77	18.4
	Milk and milk product	73	17.6

According to BMI-for-age Z score 73.2% of adolescents were healthy while 4%, 19.3%, 3.3% and 0.2% of adolescents were severely thin, thin, overweight and obese respectively (SD=1.4) (Figure: 3). Regarding height-for-age Z score 85.4% of adolescents were normal, 3.9% were severely stunted and 10.7% were moderate stunted respectively (SD=1.2) (Figure: 4).

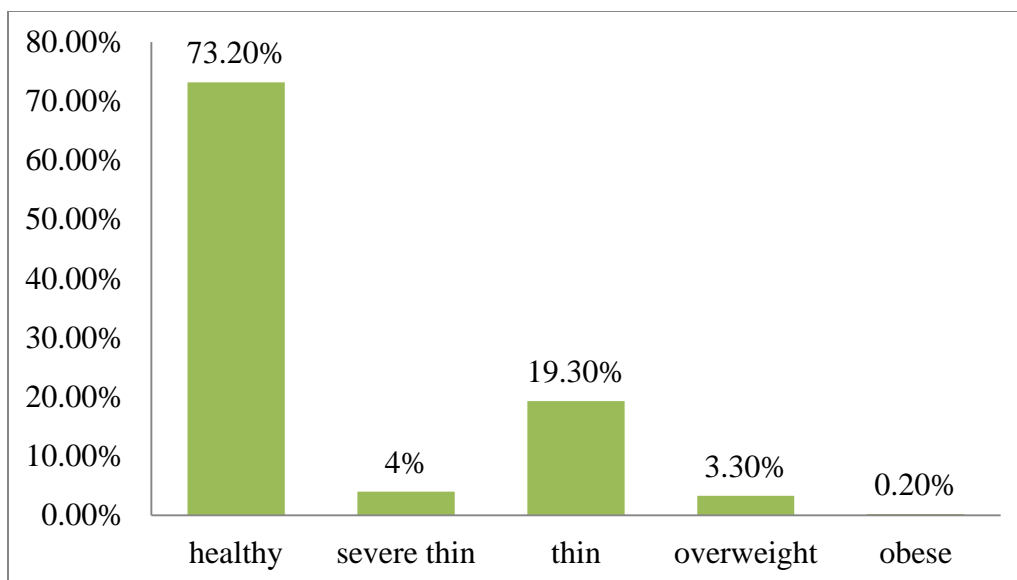


Figure 3 BMI- for age Z-score comparison of WHO reference and adolescent in coffee growing areas of Hambela Wamena District, West Guji zone, ,Ethiopia(n=417),2024.

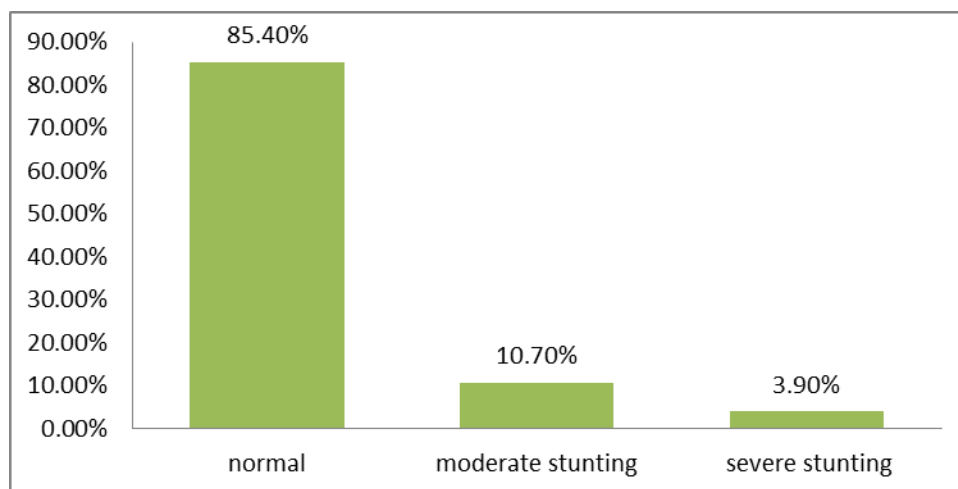


Figure 4 Height for age Z-score comparison of WHO reference and adolescent in coffee growing areas of Hambela Wamena District, West Guji zone, ,Ethiopia(n=417),2024

6.2.1 Food security status

It has been observed that 239(57.4%) of adolescents were food secure. On the other hand, of the food insecure adolescents, 126(30.1%) 95% CI (24.96, 29.21), 33(8%) 95% CI (22.02, 26.15), and 19(4.5%) 95% CI (16.14, 20.39) of them were mild food insecure, moderate food insecure and severe food insecure respectively (Figure: 5).

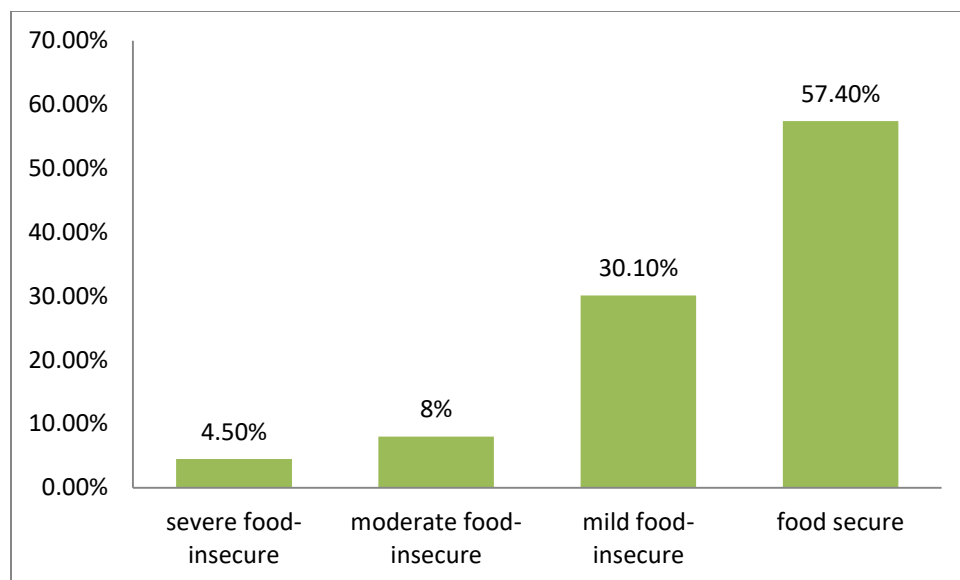


Figure 5 food security status of adolescents in coffee growing areas of Hambela Wamena district, west Guji, Oromia, Ethiopia, 2024

6.3 Factors Associated With Adolescents' Food Insecurity

As for gender, male adolescents had 0.48 times lower risk of being in severe food insecurity in comparison to female adolescents (OR=0.49, 95%CI (2.28, 3.13), P=0.02)

As for family size, adolescents whose family had more than five families had 3.73 times higher odds of being in severe food insecurity category versus combined all lower category as compared to adolescents whose family size was less than three (OR=3.73, 95%CI (19.41, 21.54), P < 0.001) or the odds of being in severe food insecurity category for adolescents 3.73 times increase with increasing family size.

As for household head, adolescents whose household headed by females had four times higher risk of being in severe food insecurity versus all other lower category as compared to adolescents for those household headed by males (OR=4.26, 95%CI (1.34, 2.59), P < 0.001) or the odds of food insecurity for adolescent's household headed by females 4.26 times higher than those adolescent's household headed by males.

Regarding own farm lands, adolescent's families who had own farm land had 80.2% less likely to be in severe food insecurity category versus all other lower category as compared with those adolescent's families who did not had their own farm land

(OR=0.198, 95%CI (1.83, 2.41), $P < 0.001$) or the odds of having severe food insecurity for adolescents were 80.2% lower when adolescent's families had own land for farm.

Concerning socio economic status of adolescents families, compared to their counterparts, adolescents who had families with poor socio economic status had 9 times higher risk to fall into higher category in terms of food insecurity as opposed to lower category (OR=9,95%CI(2.59,4.95), $p < 0.001$).

Table: 4 Ordinary logistics regression analysis for factors associated with adolescent's food insecurity in Hambela Wamena District, west Guji zone, Oromia regional state, Ethiopia, 2024.

			OR	Estimates	P-Value	95% CI
Threshold	Adolescent food security status	Severe food insecure		-26.39	0.000**	(16.14,20.39)
		Moderate food Insecure		-23.3	0.000**	(22.02,26.15)
		Mild food insecure Food secure		-20.59 0 ^a	0.000**	(24.96,29.21)
Location	Age in years		1.1	0.09	0.23*	(-0.26,0.06)
	Sex of respondent	Male	0.49	-0.70	0.02**	(2.28,3.13)
		Female		0 ^a		
	Father education	Illiterate	1	0.01	0.99*	(-0.99,1)
		Read and write	2.1	0.74	0.42*	(-1.01,2.57)
		Primary school	1.4	0.34	0.51*	(-0.66,1.34)
		High school	2.36	0.86	0.18*	(-0.38,2.10)
	Father occupation	College and above		0 ^a		
		Farmer	0.52	-0.65	0.42*	(0.64,2.23)
		Merchant	1.57	0.45	0.65*	(-1.46,2.35)
		Government employed		0 ^a		
	Family size	>5	3.73	-17.11	0.000**	(19.41,21.54)
		3-5	1.53	-20.30	0.000**	(16.86,18.26)
		<3		0 ^a		
	Sex of HH head	Female	4.26	1.45	0.000**	(1.34,2.59)
		Male		0 ^a		
	Own farm land	Yes	0.198	-1.62	0.000**	(1.83,2.41)
		No		0 ^a		
	Wealth index	Poor	9.13	2.22	0.000**	(2.59,4.95)
		Medium	2.51	0.92	0.005**	(1.57,3.46)
		Rich		0 ^a		

Note: OR-odds ratio, CI-confidence interval

**-significant, *-not significant, 0^a-reference

6.4 Qualitative Results

Fifteen interviews were conducted with key informants.15 key informants were transcribed and analyzed. Key informants were accessed through partnership building existing food insecurity in the Kebele such as adolescent's families,kebele's

leaders, kebele's managers, kebele's DA, health extension workers, woreda health and agricultural office. The interview participants were key informants who were selected because of their working experience, vulnerability to food insecurity and knowledge on the topic. Interviews were generally between thirty minute and one hour length.

15(100%) of key informants were married. Regarding educational status of participants 9 participants were diploma holder, 2 participants were degree holder and 3 participants were grade 5-9. The key informant interviews stopped on 15 due to information saturation. Four themes to explore adolescent's food insecurity emerged from qualitative study findings. The theme includes financial understanding, Awareness of Food insecurity, challenges arising from food insecurity and Dietary diversity.

Table 5: Number of theme, category and code emerged from the participants to explore adolescent's food insecurity among adolescents of coffee growing areas of Hambela Wamena district, 2024

Theme	Category	Code
Income generating activity	Agricultural practice	Lack of farm land, land scarcity to farm different variety of crops, understanding of their parents' finances, including income and expenditure
Awareness of Food insecurity	Food insecurity	Inadequate food for adolescents There are families which had no enough food
challenges arising from food insecurity	Food accessibility	When faced with the challenge of insufficient food, commonly described reducing their portions
	Food availability	Availability of food for adolescents when they were hungry
Dietary diversity	Fruit	Frequency of eating, variety of food for feeding,lemon,apple,mango
	Vegetables	Cabbage,carrot,lettuce
	Protein	Meat,milk,legumes
	Carbohydrate	Maize,enset,bread

6.4.1 Theme One: Income Generating Activity

The majority of respondents showed a thorough awareness of parents' financial situation, including their income, expenses, and the timing of money transfers within the family. The majority of respondents' discussions regarding income focused on how many families were farmers. Families with large farm holdings and diverse crop varieties were able to feed their families well and did not face food shortages. Families with multiple children, no land for farming, and migration from another woreda in search of employment were a concern in the community. Coffee occupied agricultural land; no acreage was available for crop production. The amount of land available was gradually decreasing. There was a lot of daily labor migration out of the Gedeo zone, which led to a rise in land shortages. The majority of responders showed a sophisticated comprehension.

“Since our land was cultivated by coffee we have no place for different crop production and animal.” (46 years old Kebele manager KII)

“Our livelihood depends on coffee so when coffee goes unfruitful and also the price goes down, life becomes very difficult for us especially for people with many families.” (46 years old male adolescent's family KII)

“Our production of coffee only has exposed us to various problems; for example, our family cannot get various types of food.” (38 years adolescent's family KII)

“When we compare the price of coffee with other it is very different so I prefer different crops production with coffee.” (40 years old male adolescent's family KII)

“if we cultivate inset and coffee on our own land we use inset for family food and sale coffee and we use this money different purpose such clothes, house buildind,school fees.....” (37 years Kebele leader KII)

“It has been about one year I arrived from Gedeo zone and worked in coffee industry but I did not get enough money for feeding my children.” (40 years adolescent's family KII)

“Because we don't have ingredients most of the time because I haven't got enough we eat the food that we don't prefer only for fullness of our stomach.” (46 years adolescent's family KII)

“The income that we earn from coffee is less than our annual spending needs.”(47 years adolescent’s family KII)

6.4.2 Theme Two: Awareness of Food Insecurity

Respondents described episodic food insecurity in various forms, for example, in the community, and amongst known individuals, including extended family members, parents’ friends, or students who went to school ‘with nothing to eat’. In discussing food insecurity within key informants, and some of the drivers that influence food choice, respondents referenced broader social issues such as homelessness, people having different amounts of money, land for farm and unemployment. In response to the question “Are there any other things that families can do if they don’t have enough production for food?” They responded that they could get a job, ask people for money, stop drinking alcohol, they do daily labor or eat smaller quantities.”

“Sometimes in our Kebele there are families that don’t have enough food due to lack of land for farm, drinking alcohol money they get from selling coffee, families with many children and those family who rent their land.”(35 years health extension worker KII)

“My husband was died by motor accident two years ago and rarely do I get any dinner; For example there are ten people in my house right now.”(45 years adolescent’s mother KII)

“When food was scarce due to financial restraints, they used to increase the use of available resources. These included buying of cheaper and street food; borrowing money from friends and neighbours, doing daily labor with less salary.”(35 years Kebele manager KII)

“Sometimes food choices were limited due to insufficient of crop and inset production because of scarcity of land or climatic changes or decreasing coffee price.”(35 years woreda agricultural office expert KII)

“Based on respondent’s narratives household composition and numbers of families within household influence food availability.”(38 years Kebele DA KII)

“Our farmers face difficulty on decision making about how to allocate their coffee income for shelter, foods and other needs until next year.”(36 years woreda agriculture manager KII)

6.4.3 Theme three: challenges arising from food insecurity

Category 1: Food sufficiency

When faced with the challenge of insufficient food, participants commonly described reducing their portions or skipping meals so that their children would not go hungry:

“I have not eaten my dinner because there was no enough food in our home.” (40 years adolescent’s mother KII)

“Our respondent explained food insecurity as a short-term crisis; others often went without food for longer periods.” (47 years Kebele leader KII)”

Category 2: Food availability

The majority of participants reported that food was available for their adolescents when they were hungry.

“Especially when all adolescents in the home they need to eat food all the day so we finish our eating materials and need extra resource.” (50 years adolescent’s father KII)

“I am model farmer in the Kebele and I cultivate different crops alongside with coffee and so my families had got enough food we eat meat every week.” (45 years adolescent’s father KII)

6.4.4 Theme four: Dietary diversity

The majority of respondents discuss how a diverse diet is essential for the growth and development of adolescents. According to several respondents, meat and dairy products are sources of good nourishment. Dietary diversity was a concern in the research area. The majority of teenagers are unable to select the foods they desire. Adolescents have erratic eating habits, relying on quick food instead of a varied diet. Fruits, vegetables, and animal products are among the foods that the majority of teenagers don't eat. Because of their academic schedules, the majority of teenagers skip breakfast with their families. Nutritional education and screening for adolescents are not viewed in the same light as child and maternal.

“In our woreda maternal and child nutrition got more attention but for adolescents there is no nutritional screening and no nutritional education.” (34 years woreda health office administration KII)

“We have no extra money to buy different fruit, vegetables and cereals so we eat only inset every day but sometimes eat meat.” (47 years adolescent’s father KII)

“Since our agricultural land is mostly occupied by coffee and inset we don’t produce other cereal crops, fruit and vegetable so that our families cannot consume different types of food.” (46 years Kebele manager KII)

“The problem in our Kebele regarding dietary diversity is farm land scarcity because farm land is occupied by coffee and some are not interested to produce cereal crops, fruit and vegetables because coffee price is high as compared to others.”(30 years Kebele DA KII)

“I have nine children and I can’t afford these children different variety of food and we eat only what we get.”(46 years adolescent’s mother KII)

6.5 Discussion

The prevalence of adolescent’s food insecurity was found to be 30.1% 95% CI (24.96, 29.21), 8%, 95% CI (22.02, 26.15 and 4.5% 95% CI (16.14, 20.39), of adolescents were mild food insecure, moderate food insecure and severe food insecure respectively in the current study. Study done in Hosanna showed that 11.1%, 13.6% and 17% of adolescents were mild food insecure, moderate food insecure and severe food insecure respectively(4) which the overall adolescent’s food insecurity is nearly similar with current study. Study done in Bangladesh showed that frequency of adolescent food insecurity was 5.7%,0.7% and 0.9% of adolescents were mild food insecure, moderate food insecure and severe food insecure respectively(11). The current study revealed that more than half of study participants have above mild food insecurity level or combined moderate and severe food insecurity which is higher compared to WHO recommendations(36).

The observed difference may be due to regional, socio-economic factors, food system, accessibility to resource and seasonal variation of coffee harvest. This study was done in pre harvest season of coffee which is more vulnerable to food insecurity. At this time income from the previous year’s harvest had usually been spent on basic necessities and the necessary farm investments throughout the year. And also this may be due to differences socio economic status and in the study area coffee was main livelihood for many families which is susceptible to different shocks such as diseases and price drop that increases adolescent’s food insecurity.

Concerning adolescent’s dietary diversity, the prevalence of low dietary diversity was 38.6%. But study done in Lay Guyint Woreda showed that prevalence of low dietary diversity was 53.2 % (36)which is higher than the current study. This difference may be due to improving socio economic status of community and increasing education.

The prevalence of underweight and stunting were found to be 23.3% and 14.6% corresponding in the current study. However underweight and stunting was found 9.5% and 12.1% in Bangladesh (11). Study done in Sidama zone showed that 10.4% of adolescents were stunted and 12.8% of adolescents were underweight(26) which is almost lower than present study. This may be due to differences in socio economic status, feeding practice and study time. According to the current study around 26.8% of adolescents face double burden of nutrition (23.3% underweight, 3.3% overweight and 0.2% obese).This study findings was nearly similar with study done in Bangladesh (11).However lower than study done in Sidama zone (30%)(26) and study done in Kenya 4.7% thin,19.3% overweight and 12.9% obese respectively (7) This may be due to socio economic status and study period.

Male adolescents had 0.48 times lower risk of being in severe food insecurity in comparison to female adolescents. This finding is in line with study conducted in Bangladesh(11) and Kenya (7). Possible explanation is in households the distribution of food and resource might be influenced by the number of males versus females affecting the food security status of adolescent boys and girls. Certain cultural practice may dictate food distribution within families by favoring male over female.

Adolescents whose family had more than five families had 3.73 times higher odds of being in severe food insecurity category versus combined all lower categories as compared to adolescents whose family size was less than three. This finding is in line with study conducted in Hosanna(4).

Possible explanation is larger family require more food and the basic nutritional needs increase with number of family size which can strain limited financial resources. Larger families especially that lower income may not be able to afford bulk purchase or not have means to store large quantity of food.

Adolescent whose living with female headed household were more likely to be food insecure than male headed household. This finding is in line with study conducted in Addis Ababa and Zimbabwe which found out that female headed household were more likely to be food insecure than there counterpart/male headed households(re(38)(39). Possible explanation is food insecurity among female headed households can be

attributed to combination of socioeconomic and cultural factors. This can lead to limited financial resources available for purchasing food.

Adolescent who were member of household who did not have their own farm land were more likely to be food insecure than their counterpart which is in line with study in Jimma who found out that household who did not have their own farm land were more food insecure than household who have their own land(33).

Possible explanation is households with their own farm land can grow a variety of crops and raise livestock's, allowing them to produce significant portion of their own food. This reduces their reliance on external markets decreasing vulnerability to price fluctuation. This can also contribute for the family members to afford to gain diversified diets.

Adolescents from families with limited financial resources are at a significantly increased risk of experiencing higher levels of food insecurity. Research indicates that these adolescents are nine times more likely to fall into the higher category of food insecurity compared to their counterparts from more affluent families. The current study finding is in line with study done in Addis Ababa (40), Sidama zone (26) and Kenya(7).

Possible explanation is that high socioeconomic households have better access to resource, including information about nutrition and social network that can provide support. This knowledge and resource access can help in making informed food choice.

6.6 STRENGTH AND LIMITATIONS OF THE STUDY

6.6.1Strength of the Study

The strength of this study is that a mixed methods approach (using both qualitative and quantitative data) was used. The study focused on adolescents, a group that is often neglected in studies of international health. Since it was a community-based study it has resulted valuable and higher degree of generalizability finding as per objectives of the study.

6.6.2 Limitation of the Study

As this study used a cross-sectional study design, it is difficult to determine the true relationship between adolescent's food insecurity and potential independent factors. The study findings may also be liable for recall and social desirability bias.

6.7 Conclusion

The study revealed that more than half of study participants have above mild food insecurity level or combined moderate and severe food insecurity which is higher compared to WHO recommendations. These findings align with similar research conducted in different regions, suggesting a broader pattern of adolescent food insecurity globally. The regional variations observed may be attributed to socio-economic factors, food system dynamics, and seasonal agricultural conditions, particularly in contexts like the pre-harvest period where rural families face heightened vulnerability.

Beside under nutrition there were significant percentage of overweight and obese which is quite substantial in terms of double burden of nutrition. Factors such as family size, household head's gender, land ownership, and economic resources were identified as critical determinants influencing food security status. Specifically, larger family sizes and female-headed households were correlated with increased food insecurity, highlighting the socio-cultural factors that impact food distribution within households.

The findings also emphasize the need for targeted interventions to address food insecurity and malnutrition among adolescents, particularly in economically disadvantaged communities. By recognizing the complex interplay of socio-economic factors, community dynamics, and agricultural practices, stakeholders can develop strategies to enhance food security and promote healthier dietary practices among adolescents. Moving forward, it is essential to foster community resilience through improved access to resources, education, and support systems to mitigate the effects of food insecurity and ensure the well-being of adolescents.

6.8 Recommendations

Based on the findings of this study, the following recommendations are forwarded to the concerned bodies. Addressing food insecurity among adolescents in coffee-growing areas requires a multifaceted approach that considers the unique circumstances of these communities.

6.8.1 At Household and Community Level

Make all efforts to actively involved in off-farm and income generating activities, diversify their economies in view of withstanding food shortages during crisis and avoid visible risks.

6.8.2 For Women, Child and Youth affaire

Strengthening gender equality and the status of women and girls through effective behavior change communications at grassroots level needs to be considered

6.8.3 Recommendation of woreda health office

1. Nutrition Education Programs

Implement community-based nutrition education programs specifically targeting adolescents. Provide information on balanced diets, proper meal planning and the importance of local food sources. Use peer educators and youth groups to enhance the reach and effectiveness of these programs..

2. School health and nutrition initiatives

Partner with local school to develop school meal programs that provide healthy and nutritious meal to students, ensuring that adolescents receive adequate nourishment during school hours. Promote the establishment of school gardens to teach students about agriculture and nutrition. Proper nutrition education at the primary and secondary levels of education should enable teens to have sufficient nutritious foods.

3. Access to health service

Ensure that health service include adolescent-friendly health clinics that provide essential health information, reproductive health service and nutritional counseling. Track and monitor health indicators related to food security in adolescents, using data to inform intervention. The possible areas of intervention that emanate from the results of the study are as household size and food insecurity are positively related serious attention has to be given to limit number of dependent age group in the study area. This can be achieved by creating sufficient awareness and strength effective family planning utilization in the study area households.

4. Community awareness campaigns

Conduct campaigns to raise awareness about food insecurity effect on health and development, enabling community to recognize and address these issues.

6.8.4Recommendation of woreda Agriculture office

1. Support sustainable agricultural practice

Encourage sustainable farming methods among local coffee farmers that can also support food crops with coffee plantations to improve soil and yields.

2. Training and capacity building

Organize training programs for farmers focusing on diverse crops production , soil management, and post-harvest handling to enhance food availability. Educate farmers on the benefit of growing traditional and nutritious food crops alongside cash crops like coffee.

3. Promote Diversified Farming

Encourage Crop Diversity: Support farmers in diversifying their crops beyond coffee to include fruits, vegetables, and legumes, which can help improve dietary diversity.

Livelihood diversification projects should focus on training coffee growers in beekeeping and animal husbandry activities, the high value product from which farmers can sell to local markets.

Support Agroforestry: Promote agroforestry practices that integrate food crops with coffee cultivation to enhance food security and protect the environment.

Community Gardens: Establish community gardens that encourage adolescents to participate in growing their own food, providing both food security and educational opportunities.

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Annex

Annex-1: Participant Information Sheet and Consent Form for parents/adolescents

Hello, my name is _____. I am working as a data collector for the study being conducted in this Kebele by MPH Nutrition student who are studying for their Master's degree in Nutrition at Health science College Department of Public Health, Salale University, I kindly request you to lend me your attention to explain

to you about the study and being selected as the study participant.

The study title: Adolescent food insecurity in coffee growing area in Danse Sayisa, Buku Sasyisa and Banti Nenka kebeles, Hambela Wamena woreda, West Guji zone, Oromia, Ethiopia, 2024

Purpose of the study: The findings of this study can be of a paramount importance for the woreda Agriculture office, woreda administration office and woreda health office to plan intervention programs to prevent and reduce malnutrition among adolescents and others; thereby improve adolescent health and survival in general.

Procedure and duration: I will be interviewing you using a questionnaire so that you will provide me with pertinent data that is helpful for the study. I will measure your weight, height. The interview will take about 10 - 20 minutes. So, I kindly request you to spare me this time for the interview.

Risks and benefits: The risk of being participant in this study is very minimal, but only taking few minutes from your time and very minimal pain while pricking your finger tip. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information for the local health planners.

Confidentiality: The information you will provide us will be confidential. There will be no information that will identify you in particular. The findings of the study will be general for the study community and will not reflect anything particular of individual persons or housing. The questionnaire will be coded to exclude showing names.

Rights: Participation for this study is fully voluntary. You have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Contact address: If there are any questions or enquires any time about the study or the procedures, please contact us by the following address.

The principal investigator: Mobile -0910367169,

Email address: amanismo3@gmail.com

Informed consent:

I have read/ was read to me the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I will informed that my daughter have the right to withdraw from the study at any time or not to answer any question that she does not want to answer. Therefore, I on behalf of my daughter declare my voluntary consent to participate in this study with my initials (signature).

Name and signature of parent/guardian/Adolescents _____sig._____date ____

Name and signature of data collector . _____sig. _____date _____

Annex-2: English Questionnaire

Section -1: Socio –economic Characteristics and environmental factors		
Q.N	QUESTION	RESPONSE WITH THEIR CODE
1	Age of respondent	DOB ____/____/____
2	Sex of respondent	1.male 2.female
3	Residence of respondents	1.Rural 2.Urban
4	Religion	1. Muslim Orthodox 2. Catholic 3. Protestant 4. Wakefata
5	Ethnicity	1. Oromo 2. Amhara 3. Gedeo 4. Other _____
6	What is your current Marital status	1. Single 2. Married 3. Divorced 4. Widowed

7	What is your living arrangement	1. Living with parents / partners 2. Living with relative 3. Living with friends in rental house 4. Living alone in rented house 5. 5.others (Specify)_____
8	Sex of household head	1. Male 2. Female
9	Educational status of father	1.Illiterate 1.Read and write 2.Primary school/1-8/ 3.High school/9-12/ 4.College and university
10	Educational status of mother	1.Illiterate 2.Read and write 3.Primary school/1-8/ 4.High school/9-12/ 5.College and university
11	Occupation of father	1. Daily laborer 2. Merchant 3. Private organization Employed 4. Government employee 5. Farmer 6. Unemployed 7. Others (specify)___
12	What is the total number of family members currently living in your house? (including all individuals will stay and stayed for greater than 6month)	1. Family size___
13	Do you wash your hand after toilet?	1. Yes 2. No
14	If Q12 is yes what they use to wash their hands	1. Always with soap/ash 2. Some times with soap 3. No with soap
15	What is the source of food for HH?	1. Farm(Produced) 2. from Market(Purchase) 3. From Both 4. from Donor
16	Do you have Missed breakfast in a week?	1. Yes 2. No

Section -2 Household Wealth index

Code	Variables /questions	Possible responses	Remark
17	Does your household have electricity?	1. Yes 2. No	
18	Does your household have radio?	1. Yes 2. No	
19	Does your household have a television?	1. Yes 2. No	
20	Do your household members have a computer?	1. Yes 2. No	
21	Does your household have refrigerator?	1. Yes 2. No	
22	Does your household have a table?	1. Yes 2. No	
23	Does your household have a chair?	1. Yes 2. No	
24	Does your household have bed with cotton/spring mattress	1. Yes 2. No	
25	Does your household have electric mitad/pan?	1. Yes 2. No	
26	Does your household have kerosene lamp/ pressure lamp?	1. Yes 2. No	
27	Does your household have watch?	1. Yes 2. No	
28	Does your household member have a mobile telephone?	1. Yes 2. No	
29	Does your household member have a bicycle?	1. Yes 2. No	
30	Does your household member have a motorcycle?	1. Yes 2. No	
31	Does your household have animal-drawn cart?	1. Yes 2. No	
32	Does your household have car or truck?	1. Yes 2. No	
33	Does your household member have a bank account?	1. Yes 2. No	
34	Does your household have your own house?	1. Yes 2. No	
35	Does your household have own land for farm?	1. Yes 2. No	

36	If yes how many hectares of agricultural land Does your household have?	_____	
37	How many domestic staff do you have?	_____	
38	Number of members per sleeping room?	_____	
39	How many Oxen Does your households have?	_____	
40	How many other cattle Does your household have?	_____	
41	How many horses Does your household have?	_____	
42	How many donkeys Does your household have?	_____	
43	How many mules Does your household have?	_____	
44	How many goats Does your household have?	_____	
45	How many sheep Does your household have?	_____	
46	How many chickens or other poultry Does your household have?	_____	
47	How many Beehives Does your household have?	_____	
48	What is the main source of drinking water for members of your household?	1. Piped water 2. Protected well 3. Unprotected well 4. Protected spring 5. Unprotected spring 6. Lake/river 7. Other specify-----	
49	What is the type of toilet facility for household?	1. Shared toilet 2. Flush to pit latrine 3. Ventilated improved pit latrine 4. Pit latrine with slab 5. Pit latrine without slab/open pit 6. No facility/bush/field 7. Other specify	
50	If shared for the above question, what is the type of shared toilet facility for household?	1. Flush to pit latrine 2. Ventilated improved pit latrine 3. Pit latrine with slab 4. Pit latrine without slab/open pit	

		5. Other specify	
51	What is the type of cooking fuel for household?	1. Electricity 2. Wood 3. Straw/shrubs/grass 4. Natural gas/ Biogas 5. Kerosene 6. Charcoal 7. Animal dung 8. Agricultural crop wastes 9. Other specify	
51	What is the main floor material the house?	1. Mud 2. Sand 3. Wood planks 4. Cement 5. Other specify	
52	What is the main roof material of the house?	1. Grass 2. Metal/ corrugated iron 3. Cement 4. Palm/bamboo 5. Other (specify)	
53	What is the main wall material of the house?	1. Wood and mud 2. Cement block 3. Sand and stone 4. Bricks 5. Other (specify)	

Section -3: Questions related to dietary diversity (24 hour recall)

I would like to ask you about the types of foods that you feed from sunrise yesterday to sunrise today with in **24 hour**, whether at home or outside the home. Read the list of foods below and place a one in the box if you ate the food in question, place a mark in the box if a child didn't

S	Food group	Examples	Mark
---	------------	----------	------

N			
54	Starchy staples (grain, Cereals, white roots & tubers)	Maize, teff, wheat, sorghum, or any other grains or foods made from these (e.g. Injera, bread, pasta, macaroni, kinche, rice, atmit, bread, & White potatoes, sweet potato, carrot, or other foods made from roots like godore.	1. Yes 2. No
55	Vitamin A rich fruits, vegetables & tuber	ripe mango, ripe papaya, dried peach, and fruit juice made from these, carrot, or sweet potato that are orange inside & other locally available vitamin A rich vegetables (e.g. red sweet pepper)	1. Yes 2. No
56	Other fruits and vegetables	Other vegetables (e.g. tomato, onion, eggplant) <i>other locally available vegetables</i> other fruits, including wild fruits that fruit juice.	1. Yes 2. No
57	Dark green leafy Vegetables	Wild forms and locally available vitamin A rich leaves such as Lettuce, Cabbage, spinach, kale.	1. Yes 2. No
58	Meat, poultry, fish and sea food	liver, kidney, heart or other organ meats or blood-based foods beef, pork, lamb, goat game and chicken.	1. Yes 2. No
59	Eggs	Eggs	1. Yes 2. No
60	Legumes, nuts and seeds	Dried beans, dried peas lentils, nuts, seeds or foods made from these (e.g. shiro wet, kik wet, misir wet, shimbrakolo, bakelaashuk, adenguare, boloke).	1. Yes 2. No
61	Milk and milk products Milk	Milk, cheese, yogurt or other milk products like aguat, arera.	1. Yes 2. No
62	Oils and fats	Oils and fats	1. Yes 2. No
63	Sweets	Any Sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies and cakes	1. Yes 2. No
64	How many times you eat per day?	1. Once 2. Two times 3. Three times 4. More	

**Section-4 Household food insecurity access scale
measurement questionnaire – 30 day**

Q1. During the last 4 weeks, was there a time when you were worried you would not have enough food to eat because of a lack of money or other resources?	1. yes 2.No
If Q1 is yes how often this did happen?	1=rarely 2=sometimes 3=often
Q2.In the past 4 weeks, were you or any household member not able to eat the kinds of food you preferred because of lack of resource?	1.yes 2.No
If Q2 is yes how often this did happen?	1=rarely 2=sometimes 3=often
Q3 in the past 4 weeks did you or any household member has to eat a limited variety of foods due to lack of resource?	1.yes 2.No
If Q3 is yes how often this did happen	1=rarely 2=sometimes 3=often
Q4 in the past 4 weeks did you or any household member has eat some foods that you really did not want to eat because of lack of resource to obtain other types of food?	1.yes 2.No
If Q4 is yes how often this did happen?	1=rarely 2=sometimes 3=often
Q5 in the past 4 weeks did you or any household member has to eat smaller meal than you felt you needed because there was not enough food?	1.yes 2.No
If Q5 is yes how often this did happen?	1=rarely 2=sometimes 3=often
Q6 in the past 4 weeks did you or any other household member has to eat fewer meals in a day because there was not enough food?	1.yes 2.No

If Q6 is yes how often this did happen?	1=rarely 2=sometimes 3=often
Q7 in the past 4 weeks was there ever no food to eat of any kind in your household because of lack of resource to get food?	1. Yes 2. No
If Q7 is yes how often this did happen?	1=rarely 2=sometimes 3=often
Q8 in the past 4 weeks did you or any household member go to sleep at night hungry because there was not enough food?	1.yes 2.No
If Q8 is yes how often this did happen?	1=rarely 2=sometimes 3=often
Q9 in the past 4 weeks did you or any household members go a whole day and night without eating anything because there was not enough food?	1.yes 2.No
If Q9 is yes how often this did happen?	1=rarely 2=sometimes 3=often

Rarely =once or twice in the past 4 weeks

Sometimes=3-10 times in the past 4 weeks

Often=more than ten times in the past 4 weeks

Section-5 FOOD CONSUMPTION SCORE

How many days, in the last 7days, have you eaten the following food Items?		A	B	FCS
		Number of times 0-7	Weighting	Food Consumption Score Calculation (A*B=FCS)
Cereals and tubers	Maize, teff, wheat, sorghum, or any other grains or foods made from these (e.g. Injera, bread, pasta ,macaroni, kinche, rice, atmit, bread, & White potatoes, sweet potato, carrot, or other foods made from roots like inset(kocho).		2	
Pulses	Dried beans, dried peas lentils, nuts, seeds or foods made from these (e.g. shiro wet, kikwet, misir wet, shimbrakolo, bakelaashuk, adenguare, boloke).		3	
Vegetables	and locally available vitamin A rich leaves such as Lettuce, Cabbage, spinach , kale		1	

Fruits	ripe mango, ripe papaya, dried peach, and fruit juice made from these, carrot, or sweet potato that are orange inside		1	
Meat and Fish	liver, kidney, heart or other organ meats or blood-based foods beef, pork, lamb, goat game and chicken .		4	
Milk	Milk, cheese, yogurt or other milk products like aguat, arera.		4	
Sugar	Any Sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies and cakes		0.5	
Oil	Oils and fats		0.5	
Condiments			0	

Section-6 Anthropometric Measurement

S.No	Types of Measurement	Average of measurement
1	Height in centimeters	_____centimeter
2	Weight in kilograms.	_____KG

Part I- Checklist for in depth interview tools

Time of interview _____ Date_____

Interviewer name _____ Note taker _____

1. Personal information

1.1. How many years have you been living in this Kebele?

1.2. What is your responsibility in the community?

2. Information about nutrition and related problem of the community

2.1. What kinds of foods do you normally eat? For example, what do you usually eat in the morning, afternoons, and evenings?

2.1.1. Do you know the definition of food insecurity?

.....
.....

2.1.2 Are there specific reasons why you eat the types of foods you eat? (e.g., health)

.....
.....
.....
.....
.....
.....

2.3. What do you think are the major factors for the Nutritional problems?

.....
.....

2.4. What do you think are the possible solutions for this problem?

.....
.....

2.5. Who do think are the most affected population group?

1. Under 5 children.....
2. Pregnant and lactating mother.....
3. 10-19 population
4. Adult population.....
5. Elderly population
6. All population group

2.6. Are there any efforts tried by various stakeholders to solve the problems? What efforts & when?

.....
.....
.....

2.7. Are you sure the interventions successful in reducing the problem? If not, why?

.....
.....

2.8. Do you think that the communities contribute something to alleviate the problem? How & what?

.....
.....

2.9. Did health institution or Kebele administration help to solve the problem? In what area did they work?

.....
.....

2.10. Do you have any general comment or idea you want to add?

.....
.....
.....

Appendix 3: Afan Oromo Version Questionnaire

Gaaffilee Afaanii Hirmaattota Waliin Godhamu

Maqaa gandaa _____ Koodii Hirmaata _____ Maqaa

Nama odeeffannoo sassaabaa _____ Mallattoo _____ Guyyaa _____

Maqaa Supervazaraa: _____ Mallattoo _____

Guyyaa _____

**Kutaa I: Gaaffilee Haala Hawaasumma fi Odeeffanoo
Barattoota Dargaggoota**

T.La k	Gaaffilee	Filannoo	kodii
101	Saalii nama gaafatamu maali?	1. Dhiira 2. Dubartii	
102	Umriin kee waggaa meeqa?		
103	Amantaan kee maali?	1. Ortodoksii 2. Muslima 3. Protestaantii/Phenxee 4. Waaqefataa 5. Kan biraa (ibsi)_____	
104	Sabni kee maali?	1. Oromoo 2. Amaara 3. Geeda'oo 4. Kan biraa (ibsi)_____	
105	Sadarkaan barnoota keetii meeqa?	_____	
106	Baay'ina dargaggoota maatii keessa jiru meeqa?	_____	
107	Gaafataman yeroo ammaa eenyu waliin jiraata?	1. Haadha fi Abbaa Waliin 2. Haadha Qofa Waliin 3. Hiriya Waliin 4. Fira Waliin 5. Abbaa Waliin	
108	Saalli bulchaa maatii	1. dhiira 2. Dubartii	
109	Iddoon jireenya keetii eessa?	1. Baadiyyaa 2. Magaalaa	
110	Sadarkaa Barnoota Abbaa keeti meeqa?	1. Barreessu fi Dubbisuu hin danda'u 2. Barreessu fi Dubbisuu ni danda'u	

		3. Barnoota Sad.jalqabaa(1-8) 4. Barnoota sad.2ffaa(9-12) 5.Diploma Kollejji fi isaa ol	
111	Hojiin abbaan kee ittin jiraatu maalii?	1. dafqaan bulaa 2. Qotee Bulaa 3. Hojjataa Mootummaa 4. Daldalaa 5.kan biraa(Ibsa)_____	
112	Sadarkaa Barnoota Haadha keeti maali?	1. Barreessu fi Dubbisuu hin danda’u 2. Barreessu fi Dubbisuu ni danda’u 3. Barnoota Sad.jalqabaa(1-8) 4. Barnoota sad.2ffaa(9-12) 5.Diploma Kollejji fi isaa ol	
112	Hojiin Haati kee hojjate jiraattu maalii?	1. Haadha manaa 2. Qotee Bulaa 3. Hojjattuu Mootummaa 4. Daldaltuu 5.kan biraa(Ibsa)_____	
113	Baay’inni Maatii Keessani Meeqa?	_____	

Kutaa II: Gaafii Haala Hawaas-Dinagdee gaafatamaa

T.L	Gaaffilee	Deebisaa	Kodii	Skip
201	Galii Dhunfaa keetii ni qabda(Barataaf)?	1. Eyyeen 2. Miti		
202	Galiin Maatii keetii kan ji’aa meeqa?	1. Qarshii 500 gadi 2. Qarshii 500-100 3. Qarshii 1000-1200		

		4. Qarshii 1500 oli		
203	Maddii Galii keessani maalirraa argattu?	1. Qonna 2. Beeladaa fi Bu'aa beeladaa 3. Daldala Waligalaa fi bu'aa daldala 4. Mindaa Mootummaa 5. Dafqaan Bulaa		
204	Dhunfaa keetin horii,lafa qonna ni qabdaa?	1. Eyyeen 2. Miti		
205	Mana kophatti horiin keessa jiraatu ni qabda?	1. Eyyeen 2. Miti		
206	Maatiin kee lafa qonnaa ni qabani?	1. Eyyeen 2. Miti		
207	Maatiin kee lafa qonnaa qabaa?	1. Eyyeen 2. Miti		
208	Lafti qonnaa kan maatii keessani hangam takka?	_____hkt		
209	Madda nyaataa maatiin keessan eessarraa argatu?	1. Qonna(Omishaa) 2. Gabaa(Bittaadhan) 3. Lachutirraa 4. Dhaabaa Gargaarsarraa		
210	Torbee kana keessa guyyaa ciree ganamaa hin nyaatin ni qabdaa?	1. Eyyeen 2. Miti		
211	Torbaanitti guyyaa meeqa kan ciree hin nyaatin?	1. Torbaanitti guyyaa tokko 2. Torbaanitti guyyaa lama 3. Torbaanitti guyyaa lamaa fi sani ol		
212	Dargaggootaf nyaanni dabalataan maatiin kennitu ni jira?	1. Eyyeen 2. Miti		

Kutaa- III: Haala qulqullina fayyaa naannoo dargaggoota fi maatii dargaggoota

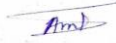
T.L	Gaaffilee	Deebisaa	kodii	Skip
	Maddii Bishaan dhugaatii keessani maalii?	1. Bombaa 2. Laga 3. Eelaa Eeggame 4.Eela hin Eeggamin		
	Maddii Bishaani yeroo baay'ee kan dhiqannaa fi waan biraaf fayyadamtan maalii?	1. Bombaa 2. Laga 3. Eela Eeggame 4.Eela hin Eeggamin		
	Maatii keessani mana fincaani ni qabu?	1. Eyyeen 2. Miti		
	Mana fincaani maatiin keessan itti fayyadaman gosa kami?	1. M/Fincaani ulaagaa eeggate 2. Mana fincaani aadaa 3. Mana fincaani waliini 4. Mana fincaani hin qabu		
	Erga mana fincaani fayyadamtee booda harka ni dhiqattaa?	1. Yeroo hunda samunan/daaraan 2. Yeroo tokko tokko saamunan 3. Saamunaan malee		
	Osoo nyaata hin nyaanne dura harka ni dhiqattaa?	1. Yeroo hunda samunan/daaraan 2. Yeroo tokko tokko saamunan 3. Saamunaan malee		
	Osoo nyaata hin qopheessine duraa harka ni dhiqattaa?	1. Yeroo hunda samunan/daaraan 2. Yeroo tokko tokko saamunan 3. Saamunaan malee		
	Balfa adda addaa ni gattaa? Eessatti gatta?	1. Dirree irrattin gata 2. Boolla keessattin gata 3. Boolla waliini keessattin gata 4. Lafatti awwaala 5. Nin guba		

**Kutaa-IV: Gaaffilee haala soorata midhaani gosa garagaraa
dargaggootan walqabatu**

Ajaja: Dargaggoonni kaleessa yeroo halkanii fi guyyaa manaas ta’e manaan alatti gosa nyaata isaan nyaatan fi dhugaatii dhugan hunda akka yaadataniif gaafadhu, Nyaata isaan yaadatani sitti himaniif gartuu nyaataa itti qoodameeratti jala sarari. Nyaanni yoo xiqqaate tokkollee jala sararama “1” jedhiiti column/gabatee gartuu nyaataa fuulduratti barreessi. Ergaa waan yaadatan dubbatanii fixani, nyaata jala hin sararamiin gaafadhu.

T.L	Gaaffii Gosa Nyaataa	Deebisaa
401	Kaleessa guyyaas ta’ee galgala nyaata akka Biddeena, qiixaa, akaawii, marqaa, daabboo, paastaa, shorbaa, ruuzii, buskutii, dinnichaa, goodarree ykn garbuu, boqolloo, qamadii,xeefii kkf nyaatte?	1.Eyyeen 2. Miti
402	Kaleessa guyyaas ta’ee galgala nyaata dheedhii waan akka baaqelaa, atara, shumburaa, loozii, boloqqee fi kkf nyaatte?	1.Eyyeen 2. Miti
403	Kaleessa guyyaas ta’ee galgala bu’aa aannanii yookiin baaduu fi itittuu dhugdee?	1.Eyyeen 2. Miti
404	Kaleessa guyyaas ta’ee galgala gosa nyaata foonii kanneen akka tiruu, kalee, onnee fi kkf nyaatte?	1.Eyyeen 2. Miti
405	Kaleessa guyyaas ta’ee galgala gosa nyaata hanqaaquu yookiin killee nyaatte?	1.Eyyeen 2. Miti
406	Kaleessa guyyaas ta’ee galgala foon horii, hoolaa, re’ee, lukkuu, ykn gosa simbirroo biraa nyaatte?	1.Eyyeen 2. Miti
407	Kaleessa guyyaas ta’ee galgala gosa nyaata muduraaleekan akka raafuu, salaaxaa,qoosxaa fi kkf nyaatte?	1.Eyyeen 2. Miti
408	Kaleessa guyyaas ta’ee galgala gosa nyaata kuduraalee kan akka kaarootii, maxaaxisaa, dubbaa, muuzii, maangoo, pappayyaa fi kkf kanneen naannootti argaman nyaatte?	1.Eyyeen 2. Miti
409	Kaleessa guyyaas ta’ee galgala kuduraa fi muduraalee biro kan akka timaatimaa, qullubbii diimaa,loomii fi kkf nyaatte?	1.Eyyeen 2. Miti

Thank you for your response!



Name of Investigator-Aman Ismo Signature

Advisor approval form

We hereby certify that we have supervised and evaluated the research thesis entitled food insecurity and associated factors among adolescents in coffee growing Kebele, Hambela Wamena district, west Guji zone, Oromia region, Ethiopia, 2024

- Dube Jara (Assitant Professor, PhD Candidate)



signature

-Tinsae Abeye (MPH)



-Habtamu Tadese (MPH)





Salale University
Institutional Research Ethics Review Committee (SIU-IRERC)

Date: 12 / 10 / 2016

Ref. No: SIU-IRERC-137/2016

To: Aman Ismo

Subject: Research Ethics Approval Letter

This is to kindly notify you that your project protocol entitled "**Food insecurity and associated factors among adolescents in coffee growing areas in Hambela-Wamena district, West Guji, Oromia region, Ethiopia, 2024.**" has been approved for the intended one-year period of implementation. *The review process of the Research protocol has been carefully conducted by* Salale University institutional research ethics review committee (SIU-IRERC). The protocol is ethically sound to be implemented through adhering to the research ethics principles during the implementation. Thus, the committee is pleased to inform you that your study protocol has been approved.

The committee would like to remind you that the research principal is expected to submit a progress report of the research at least once before the end of its implementation. The committee also looks forward to receiving the final technical report and recommendations that will be generated from the study.



Sincerely,

Solomon Balami(Phd)
Salale University IRERC
Chairperson

CC:

- Salale University Institutional Research Ethics Review Committee
- Salale University Collage of Health sciences CARD