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COLLEGE OF DEVELOPMENT STUDIES

CENTER FOR REGIONAL AND LOCAL DEVELOPMENT STUDIES

**DETERMINANTS OF SEASONAL OUT-MIGRATION AND ITS
IMPLICATION FOR FOOD SECURITY IN TSAGIBJI WOREDA, WAG
HIMRA ZONE, AMHARA REGION**

BY

GIRMA SENBETIE ASEFAWU

JUNE 2019

ADDIS ABABA, ETHIOPIA



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GIRMA SENBETIE ASEFAWU

THESIS ADVISER

KUMELA GUDETA (PhD)

A THESIS SUBMITTED TO
CENTER FOR REGIONAL AND LOCAL DEVELOPMENT STUDIES,
COLLEGE OF DEVELOPMENT STUDIES ADDIS ABABA UNIVERSITY
FOR PARTIAL FULFILLMENTS OF THE REQUIREMENT FOR THE
DEGREE OF MASTER OF ARTS IN REGIONAL AND LOCAL
DEVELOPMENT STUDIES

JUNE 2019

ADDIS ABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY
DECLARATION

This is to certify that this thesis is my original work and has not been presented for a degree in any other university, and all sources of material used for the thesis have been properly indicated and acknowledged by means of complete references.

Declared by: Girma Senbetie

Signature: _____

Date: _____

Place: Addis Ababa University College of Development Studies, Center for Regional and Local Development studies

This is to certify that this thesis entitled “*Determinants of Seasonal Out-Migration and Its Implication for Food Security in Tsagibji Woreda, Wag Himra zone, Amhara Region*” submitted in partial fulfillment of the requirements for the award of the degree of Master of Art in Regional and Local Development studies to graduate program of collage of Development studies, Addis Ababa university by Girma Senbetie (Id No: GSR/0565/10) is an original work conducted by the candidate under my supervision and this project work has not been submitted earlier for award of any degree or diploma to the best of our knowledge and belief.

Dr. KUMELA GUDETA

(Advisor)

Signature

Date

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External Examiner: _____ Signature _____ Date _____

Internal Examiner: _____ Signature _____ Date _____

Advisor: _____ Signature _____ Date _____

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Acknowledgements

My appreciation and gratitude goes to my supervisor Dr. Kumela Gudeta for his advice and support towards the progress of the study. I have been incredibly privileged to have a patient, supportive and enthusiastic supervisor. His ideas, inspiration and encouragement throughout the writing of this research thesis were vital for the completion. I thank him not only for his precious time in guiding this study but also for my professional career has been invaluable. I am grateful for his generous support.

I thank also the Wolkite University (WKU) and Addis Ababa University (AAU) for its grand financial support, which is needed to cover all costs of the research work.

I must in all sincerity express my deep thankfulness to the following institutions and individuals contributed in providing useful information and participated in data collection during the field work: Tsagibji District Rural Agriculture Development Office and its staffs, kebeles level Development Agents, Community representatives and Wag Himra Zone Food Security Office, and its staff members and officials. Especially, Mr Mekamu Asefa, Ms. Nazrawit Ayele, Mr. Lijalem Tsegaw, Mr. Tegenu. Kassie.

Finally, my special gratitude goes to the informant in Tsagibji district and survey enumerators for their honest collaboration in the field work, I wish to express my thoughtful thanks to my friends Jiregna Tadesse, Alemseged Dejene, Jemberu Molla, Markos Mamo, Dubale Abateb, Amele Getahun, Eshetu Shume, Danial Abebe, Alene Moges, Moges Girmay and Girma Alemu, for their support in material, printing, data enumeration to supplement me in the fieldwork.

Girma Senbetie

June 2019

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Acronyms and Abbreviations

ACSI:	Amhara Credit and Saving Institution
AER:	Adult Equivalent Ratio
CSA:	Central Statistical Authority
ANRS:	Amhara National Regional State
CSA:	Central Statistical Agency
EHNRI:	Ethiopian Health and Nutrition Research Institute
FAO:	Food and Agricultural Organization
FGD:	Focus Group Discussion
HFIAS:	Household Food Insecurity Access Scale
HFBM:	Household Food Balance Model
HHs:	Households
IFAD:	International Fund for Agricultural Development
IOM:	International Organization for Migration
KII:	Key Informant Interview
MAHFP:	Months of Adequate Household Food Provisioning
NELM:	New Economics of Labor Migration
NGO:	Non- Governmental Organizations
NMA:	National Meteorological Agency of Ethiopia
PCI:	Precipitation Concentration Index
PSP:	Productive Safety Net Program
SSA:	Sub-Saharan Africa
USAID:	United States Agency for International Development
UN:	United Nations
WB:	World Bank
WFP:	World Food Programme

Abstract

Migration is one of the important research agendas in regional development as it encompasses both place and people dimension besides to its dynamic nature. Thus the aim of this study is to identify the determinants of Households' seasonal out-migration and its nexus with the Food Security status by taking Tsagibji District, Amhara Region as a case. Accordingly, a quantitative research approach was mainly employed by complementing it with a qualitative approach to triangulate the findings. Parallel to the common secondary sources, the study used metrological data from NMA to get the full picture of the livelihood system in the district. in this study; The Primary data was gathered from a sample of 325 rural households using household survey, and key informant interviews and focus group discussions. were employed to gather qualitative data. Quantitative data analysis techniques: descriptive and inferential statistics were computed using STATA so to assess the availability, consumption and access aspect of household food security status, three models, namely: Household Food Balance Model (HFBM) Household Food Insecurity Access Scale (HFIAS) and Months of Adequate Household Food Provisioning (MAHFP), were computed. The result of the binary logistic model analysis revealed that, household size and participation in the productive safety net program are significantly and positively related with seasonal migration, while food security status, sex of the household head, total land size, access and use of inputs: credit service, fertilizer utilization, extension service, improved seed, tropical livestock unit, and educational status are significantly and negatively related to seasonal migration status level of rural households. Moreover, both push and pull factors namely environmental induced factors and economic reasons are the main attributing factors for migration. The result using HFBM revealed 57% of the sampled migrant households were food insecure. Seasonal migration has a positive and negative effect on the livelihood of households. Based on the findings in the research, it is suggested that income diversification, increase agricultural inputs, employment opportunities, and environmental rehabilitation is important to improve the livelihood of households.

Keywords: *Seasonal migration: Food security: Livelihood strategy: Adaptive: Coping*

CHAPTER ONE: INTRODUCTION

1.1. Background of the study

Migration is a form of geographical mobility between one geographical unit (origin) to a certain destination that involves change of residence from a place to the place of arrival (destination) (Woldegebriel, 2017). Although the study of migration impacts on rural economies has come a long way from the early dual theories of development, some of the potentially more important aspects remain to be investigated systematically. Although location theory and central place theory have each contributed considerably to our understanding of the spatial pattern of firms, their static perspective and ignorance of many important dimensions of regional economic growth, particularly labor migration, has impaired their use as a general theory of regional economic development. Theories of regional economic development incorporate these concepts into more formal expressions of regional growth dynamics. Lagging regions would benefit from urban prosperity through remittances and circular migration. In addition, spatially concentrated industrial growth generated permanent demand for labor supply, which was satisfied by mass migration of young people from rural areas leaving behind a disproportionate share of the elderly.

Migration patterns are very complex and can be divided into internal and international, the formerly, movement of persons within a country and between countries in the later. There are different streams of migration namely, rural-urban, rural-rural, urban-urban and urban-rural and it may include cross-border and international movements of people(Hunnes, 2012). Dynamics of migration goes beyond demographic, economic and spatial considerations that include the facts of individual behavior and factors in decision-making, and at the same time, takes into account how these change with time, place and affect each other(Steiner, 2009).

From the livelihood perspective, migration has become one of the important livelihood strategies for many rural households across the world as well as it is a remedy for poverty and subsistence agricultural livelihood and it can bring many benefits(Ginsburg et al., 2016; Hunnes, 2012). For regional economic development, the international dimension of migration is extensive that gained the research, and policy attention and practice area in international and regional

organizations. For places where there is environmental stress and deep rooted poverty Internal migration becomes more important in terms of the numbers of people involved and importance of remittances and poverty reduction (Beguy, et al., 2010;Grimm, 2005). The internal dimension of migration may take permanent and/or seasonal migration in the context of duration stayed in the destination. Thus, internal migration is a continuous, constant and repeated movement people as a coping livelihood strategy by rural households rather than a single event. Due to complexity of causes, pattern, selectivity, actors involved and impacts from county to country, it is difficult to measure and define through a uniform approach. Seasonal aspects of internal migration depend on seasonal conditions or period, performed only during part of the year (Dalglish et al., 2007) and it can be described as circular, repeat, seasonal or temporary.

The classic push and pull factors impose migration from poor regions to potentially rich rural and urban locations still exist and even stressed with rising population pressure and deteriorating land availability in Africa(Grimm, 2005). Causes of internal migration in developing countries relate to climate change, population pressure, technological advancement, urbanization, low agricultural productivity and poverty.

For instance study conducted on internal migration and development in developing countries sort-out, national and global level drivers such as population pressure and environmental limits, low agricultural commodity prices in South Asia, Structural Adjustment Program(SAP) in Sub-Saharan African counties, removal of population movement restrictions and good transport networks in South Africa as rural-urban migration in Africa and Asia(Adamtey, Yajalin, & Oduro, 2015; Grimm, 2005). Moreover, reasons at household level include shortage of farmland, debt, subsistence , and desire to earn additional income to supplement agricultural income(Asfaw, et al., 2010b).

Seasonal migration in rural Africa has direct relation with issue of food security as a coping livelihood strategy as households need to diversify income, in particular in environmental extremes(Hunnes, 2012). Recent report by FAO, IFAD, IOM and WFP in (2018) described the relationship between food security and migration, underscoring reducing risk of hunger and extreme poverty to smooth out income and food consumption (FAO; IFAD; IOM; WFP, 2018).

Besides when natural and human-induced factors persist for long period, seasonal migration becomes an adaptive livelihood strategy rather than coping livelihood strategy (Asfaw et al., 2010b; Gray & Mueller, 2013; Birhanu & Nachimuthu, 2017). In urban centers with boom of construction sector and expanding commercial farms in some potential productive rural parts of the country attract rural people to flow in these urban areas.

Migration as coping and adaptive livelihood strategy for Amhara region rural households has become multifaceted with respect to duration and destination similar to the countrywide (Tegegne & Penker, 2016a). In addition to, spatial and temporal variations in agricultural harvesting periods between origin and destination area, migration is one of the livelihood strategies of many rural households (Asfaw et al., 2010b; Tegegne & Penker, 2016a). According to Asfaw, et al., (2010) in earlier period farmers from north-west highlands of Gondar and Gojjam has migrated to the coffee growing areas of south-west Ethiopia during the slack agricultural season. Furthermore, thousands of people migrate to Humera, Metema, East Showa, large urban centers including Addis Ababa (Asfaw et al., 2010b).

In similar fashion, in Wag Himra Zone food insecurity and environmental extremes situation with frequent and serious disasters in Ethiopia (DPPC, 2000). The practice of seasonal migration in the Zone has a long history with consecutive drought-induced famine in the Northern part of the county including Wollo famine in 1970s (Sen, 1981). Furthermore, the zone food security Bureau reported, more than 151,869 people under the Productive Safety Net Program (PSNP) and emergency food aid in 2018 year.

1.2. Statement of the problem

Against the backdrops set in the previous section, a holistic understanding of a human phenomenon, seasonal migration, as demographic response to situations of poverty, food insecurity, conflict, and natural disasters, low agricultural productivity climate change and environmental stress in rural parts of Ethiopia on one hand (Atnafu et al., 2017; Mehari Taddele Maru, 2015) and migration as one of the most important livelihood strategies of rural people (Hunnes, 2012; Wondimagegnhu & Zeleke, 2017) appeal the attention of research and policy. Taking two broad and complex development issues, food insecurity and seasonal migration, demand stretching beyond the classic push and pull factors approach to address the multiple dimensions of complexity in a holistic manner.

First, the nature and significance of migration in development has a changing perspective initially from migration as a favorable development from rural to urban areas to migration as a natural process. Followed by the view that migration is a socially desirable phenomenon that improves and enhances an individual's growth and knowledge on one hand, and on the other the rates of rural to urban migration far exceeding the rates of job creation and surpass absorptive ability of industry on the other hand. Second, these perspectives lead to dilemmas of migration. Is seasonal migration exacerbating rural-urban structural imbalance causing urban surplus labor; and depleting rural areas of valuable human capital? Third, factors in the seasonal migration process as migration is a selective process by economic, social, educational and demographic characteristics eventually leads to multiple causal pathways and migrant characteristics. Fourth, the nature of the migration system within movement characteristics, the interventions and household's actions are embedded. That means, do migrants generally move shorter distances rather than longer ones? Why? Do their choices tend to be to a more familiar with nearer opportunities and less costly?

The above-mentioned four points make migration research complex demanding a decision on unit of analysis: territories, individuals, families or households, social classes, institutional fields or event chains. In turn this affects geographical and structural pattern of economic activity of interventions, interactions among stakeholders and participating agencies. The extent of seasonal migration is usual in the most drought-prone and food insecure areas. Likewise, Ethiopia is one

of the vulnerable countries affected by frequent and seasonal food insecurity situation in Africa (Mohamed, 2017; Wassie & Alemu, 2016). For instance, according to FAO (2017) 5.6 million people were food insecure in Ethiopia (FAO, 2017b), another, WFP report states that 7.88 million people required food assistance in 2018 (WFP, 2018). Studies on internal migration in Ethiopia indicate that the driving forces of internal migration associate with the causes and impacts of food security problem in the environmental stressed rural parts of Ethiopia (Atnafu, 2016b; Hunnes, 2012; Tegegne & Penker, 2016a; Asfaw, et al., 2010). Similarly, in 2017 5.6 - 7.78 million people were food insecure in Ethiopia (FAO, 2017b) due to high population growth, frequent droughts, dependence on rainfall and backward agriculture, poor infrastructure facility and low non-farm activities (Kopainsky, 2015; Wassie & Alemu, 2016).

This research is not the first inquiry about internal migration (in particular seasonal migration) as different scholars have conducted an inquiry on internal migration in Ethiopia. For instance, Woldegebriel, (2017) conducted a study on the impact of rural-urban migration in Sodo Town, SNNPR Ethiopia, Wondimagegnhu & Zeleke, (2017) on the determinants of rural out-migration in Habru District, Tegegne & Penker, (2016) on the determinants of rural out-migration, and Asfaw et al., (2010b) conducts on seasonal migration and rural livelihoods in Ethiopia. However, previous studies did not consider internal migration in the context of seasonality, relationships, effects and nexus of seasonal migration with food security in environmentally degraded and frequently drought prone area. Therefore, this study focuses on the research gap in identifying the determinants of seasonal migration and its implications for food security particularly taking Tsagibji district, that is one of the vulnerable area in environmental degraded, frequent drought and seasonal food insecurity problem in Wag Himira Zone.

1.3. Objective of the study

1.3.1. General objective

The general objective of the study is to investigate determinants of seasonal out-migration and its implications to rural household's food security in Tsagibji Woreda of Wag Himira Zone as origin area of migrants.

1.3.2. Specific objectives

Specifically, the research aims to

- ✓ Investigate the determinants of seasonal out-migration in place of origin.
- ✓ Assess the food security status of seasonal out-migrant households in source area.
- ✓ Identify the effects of seasonal out-migration on livelihoods of migrant households in place of origin.

1.4. Research questions

- ✓ What are the factors that determine the seasonal out-migration at household level?
- ✓ Dose seasonal out-migration is a coping livelihood strategy for migrant households?
- ✓ Who is migrates in terms of demographic, socio-economic and institutional characteristics of households in place origin?
- ✓ What is the food security status of households in source area of migrants?
- ✓ Who is vulnerable to seasonal out-migration in the origin place of migrants? Are the food insecure households more prone to seasonal out-migration?
- ✓ Is the food security status of migrant households different from that of non-migrant?
- ✓ What is the impact of seasonal out-migration have an effect on the livelihoods of migrant households in place of origin?
- ✓ Dose seasonal out-migration have a negative effect on the migrant households in the place of origin?

1.5. Significance of the study

Food security as well as migration in general, particularly seasonal out-migration are basic contemporary global issues, predominantly in developing and the least developed countries, Therefore, several research has been conducted on the internal migration in Ethiopia. However, the prior scholars thy don't consider seasonal migration nexus with household's food security statues in household's level analysis. Therefore, the research findings of this study fill the knowledge gap in local and institutional aspect of seasonal out-migration and food security as migration as coping as well as adaptive strategy of livelihood. Specifically, this study has the following significances. First, the research topic is in line with the different initiatives taken by the international and national level stakeholders to address food security at the local level.

Therefore, the study serves as a source of information for the area on activities related to seasonal migration and food insecurity by providing detail information about the situations of seasonal migration and food insecurity status of households in the study area.

Second, the study would generate reliable, relevant and scientific information about seasonal migration and food security in the area that would be based for different interventions on the problem. Third, it meets the limitation of the research on seasonal migration and its linkage with food security at local level. Finally, it provides some insights for others researchers in the area for further investigation on the issue

1.6. Scope of the study

From the conceptual point of view, the scope of the study focuses on internal dimensions of migration, particular emphasis on identifying the determinants of seasonal migration and its implications on food security of rural households as a coping and adaptive livelihood strategy. Based on this, the study focuses on identifying the determinant factors, the effect of seasonal migration and its nexus to food security status. From the geographical context, the study was conducted in Wag Himra Zone of the Amhara Region by particularly taking the case of Tsagibji district, which is frequently vulnerable to environmental extremes and food security. Moreover, methodologically this study is a cross-sectional research design, beside to this the study followed a mixed research approach that incorporates both quantitative and qualitative method of data collection and analysis. Specifically, the relevant data was gathered from migrants and non-migrant rural households from two kebeles in the district through a household survey, interview and focus group discussion (FGDs). Finally, this study was conducted only on the origin of the migrant households, therefore the relevant data was collected from the origin of the migrant households.

1.7. Limitation of the study

The aim of the study was to investigate the determinants factors of seasonal migration and its implications for food security in the case of Tsagibji District. Therefore, the study was conducted in a comprehensive and scientific manner to achieve this objective. However, in addition to addressing the aforementioned issues, this study has the following limitations.

One of the limitations of the study is concerning the study area. Since the study area has been delineated as an autonomous administration district in 2017. Therefore, institutional facilities and human resources are still limited, due to this reason, the study faced a limited access to a detailed and inclusive secondary data about the demographic and socio-economic characteristics of households, senior exerts, registered migration data.

Furthermore, the study may have a minor methodological limitation in the measurement of the food security status of the households using HFBM as the very nature of the method it considers only the availability of adequate food energy and utilization of the crop sector leaving behind products from the livestock sector. However, this can be taken as minor limitation considering the fact that majority of rural households in the study area commonly use cereal crops for food consumption. Finally, the study uses households who have access and use and who have not of credit, extension, improved seed and fertilizer to understand the institutional characteristics of sampled households in the study area, however the study might have limitations in considering the exact amount of fertilizer and improved seed in kilogram per hectare, and cash amount of money they borrowed from credit institution.

1.8. Ethical consideration

The study has been conducted in Tsagibji Woreda to identify the determinants of seasonal out-migration and its implication food security of rural households. Therefore, the study was conducted considering the basic principles of research ethics. According to Marianna & Paraskevi, (2011) the consent of participants in the study is major ethical issue in conducting research. Accordingly, in this study participants are well informed about the study and required their consent to participate in the study in all stage of data collection process. The study also takes care and responsibility to respect and consider, religious, ethnic and other sensitive issues in the research process. Furthermore, the study was conducted in respecting the culture, tradition, and language of participants, and any research subject is entitled to withdraw from the research at any time. Finally, the information received from the subjects was kept confidentially, secret and used only for the purpose of the study, and the anonymity of the participants of the study was kept.

1.9. Organization of the study

This study was organized into five basic chapters. The first chapter deals about the background, statement of the problem, objectives of the study, significance, scope as well as the limitations of the study. the second chapter discuss about the theoretical and related empirical literatures reviewed from various sources. Following this, the third chapter provides the detail of the research methodology adopted on sampling, collecting and analyzing the appropriate data. Then after, chapter four deals about major findings and result of the study. Finally, the paper presents the conclusions and recommendations in chapter five.

CHAPTER TWO: RELATED LITERATURE REVIEW

Migration is one of the common coping and adaptive livelihood strategy for rural people living in developing countries during lean period's results of agriculture downturn and seasonal hardship, People move from rural areas for a short period to maintain their family in such difficult times. Due to the complexity of human migration and food security, this requires detailed review of theoretical and empirical documents and pieces of evidences to appropriately understand and explain the phenomena. Therefore, this chapter deals with explaining the theoretical perspectives of migration, followed by presentation of empirical evidences, regarding reasons of why households diversify their livelihoods strategies through migration, determinants factors of seasonal migration and finally, the effects of migration on livelihoods of households in developing countries including Ethiopia.

2.1. Theoretical Perspectives in migration

Migration theories and perspectives can be classified depending on different factors such as the level based analysis, migration patterns, relevant disciplines, and application of such theories (Wimalaratana, 2017). Therefore, in this review migration theories based on their applicability and context.

The “Laws of Migration” is the earliest model from theoretical views concerned with migration developed by Ernest Georg Ravenstein, in1885. According to this model, rural community is migrating to commerce or industry center (town) as a goal of migration. The conclusion in-laws of migration include, economic factors as major causes of migration, most migrants travel short distances; migration happens in steps, Females are more migratory, native communities of towns are less migratory than the rural parts of the country(Ravenstein, 1885). Since that time, wide varieties of theories and explanations have been developed to describe the causes, trends, system context, and consequence of migration. This section is a concise and selective review of only on theoretical/empirical theories of migration that are relevant for seasonal migration.

2.1.1 Neoclassical theories of migration

The Neoclassical perspective on migration driven by variances in returns to labor across markets, this theory developed to explain migration in the context of economic development in the works of Hicks (1932), Lewis (1954) and Harris and Todaro (1970)(Kurekova, 2011; Massey et al., 1993; Todaro & Smith, 2011). This perspective can be classified as macro and micro level analysis. The central argument of the macro-level analysis considers migration as result of a geographic difference in labor supply and demand, and wages between labor-rich versus capital-rich area (King, 2012.; Kurekova, 2011; Todaro & Smith, 2011; Wimalaratana, 2017). At micro level analysis of migration is not the only result of wage differences, but it results as of rational cost-benefit analysis decision of migrants and individuals choice based on the abundant information about the options(Gheasi & Nijkamp, 2017; Kurekova, 2011; Massey et al., 1993).

Related to the neoclassical perspective, push and pull factors developed by Lee in 1966, push-pull factor perspective gives emphasis on economic perspective and reasons for migration(Bauer & Zimmermann, 1999; Kurekova, 2011). This perspective identifies important push and pulls factors of migration in both the origin and destination of migrants and its impact on decision-making migrants(Gheasi & Nijkamp, 2017; Kurekova, 2011). According to this framework Push factors include, non-availability of enough livelihood opportunities, poverty, rapid population growth that surpasses available resources, poor living conditions, desertification, droughts, fear of political persecution, poor healthcare, loss of wealth, and natural disasters(Dalgleish et al., 2007b; Kurekova, 2011). On the other hand, the pull factors include higher standards of living, better employment opportunities, a better educational, all of which attract people from their country of origin to the host country(Dalgleish et al., 2007b; Gheasi & Nijkamp, 2017; Stanojoska & Petrevski, 2016).

2.1.2. New Economics of Labor Migration (NELM) theory

In contrast to neoclassical approach, New Economics of Labor Migration (NELM) theory developed by Stark and Bloom has a different point of departure compared to neoclassical approach. It challenges micro and macro analysis outlined above(Massey et al., 1993). According to this theory, labor market is not only reason to migration, but also conditions of other markets such as the capital market and insurance market(Kurekova, 2011; Thieme, 2007).

Besides, migration decisions not made by isolated individual actors but, typically by families or households to maximize income and employment opportunities and to minimize risks(De Haas, 2005; Massey et al., 1993). The theory did not ignore the individual behavior of migrant, but it challenges the neoclassical approach by comparing group behavior (family or household) has become a vital standard than the individual role played by the migrant in the Neo-classical explanation(Massey et al.,1993; Wimalaratana, 2017). This view considers migration as income diversification and risk aversion strategy, mainly in developing counters(King, 2012; Massey et al., 1993).

2.1.3. Historical-structural perspectives

Historical-structural perspectives of migration includes World Systems Theory, and Dual Labor Market Theory, historical-structural perspectives link migration with structural changes in the aggregate macro level analysis(Massey et al., 1993; Thieme, 2007). World System theory developed by Wallerstein (1974), this approach associate determinant of migration to structural changes in the world markets, and this view considers migration as a result of globalization, through enlarged interdependence of economies, capital and emergence of new forms of production(King, 2012; Massey et al., 1993). Dual labor market theory introduced in 1979 by Michael J. Piore, based on this theory migration is consequences of pull factors, like structural labor demands in developed countries(Massey et al., 1993). It also argues that, migration is not the result of push factors in the origin, but it is result of pull factors in destination (Gheasi & Nijkamp, 2017; Massey et al., 1993).

2.1.4. Network theories

Network theories explain the perpetuation of migration stress the importance of kin and friendship networks in shaping and sustaining internal as well as international migration.in line with this, Network theory connect migration with interpersonal relationship between migrants in the origin and destination(Massey et al., 1993). Unlike Migration system theory, network theory focus on social capitals and it claimed that migration as result of previous social connection of migrants in origin and receiving areas(Kurekova, 2011; Massey et al., 1993). Network theory also focuses on interpersonal relationships between migrants and non-migrants(King, 2012;

Kurekova, 2011). According to (Massey et al., 1993) networks diminish the costs and threats of movement of people, and increase the estimated net returns of migrants.

2.1.5 Cumulative causation theory

Cumulative Causation Theory was developed by Gunnar Myrdal in 1956 (Wimalaratana, 2017) it argues that migration sustain itself for further movement through affecting different socio-economic factors (Massey et al., 1993). Central argument of this theory emphasis on capitalist development that is inevitable marked by depending welfare inequality, one's difference has occurred it grow as economics of scale (agglomeration and multiplier effect) perpetuate and deepen in bipolar characteristics among periphery and core region (Haas, 2015). Therefore, migration undermine regional and local economy and increasing pendency on the core region or countries, this can motivate further out migration of labor force in peripheral area (Haas, 2015; Massey et al., 1993). Moreover, it claim migration as a liner function of spatial opportunity disparity, underdevelopment and poverty (Haas, 2015).

2.2. Forms of internal migration

Typologies and classification of internal dimension migration can be depend on the following factors, such as geographical direction, period of time a person intends to stay out from place of origin, demographic and economic conditions, causes, and political-legal classification (Baggio, n.d.). Therefore, this study on four kinds of migration streams based on the geographical direction of migration in line with the classification based on the period of time a person intends to stay out from the place of origin.

The study emphases on classifications of internal migration through geographical direction migrants such as rural-urban, urban-urban, rural-rural, and urban-rural migration. These types of internal migration also classified as seasonal and permanent migration based on period of migrants stayed in the destination. However, this study is more concerned with rural out-migration and its seasonal context of internal migration, i.e. intention of the migrant, the time to spend away from his/her place of habitual residence has a limited duration (Baggio, n.d.; Gibson & Gurmu, 2012).

Rural-Urban migration is the movement of people from the countryside to the city. In most developing countries, especially in the Sub Saharan Africa, a shift from subsistence to cash crop production or manufacturing has resulted in the temporary or permanent migration of men, and sometimes women, from rural communities to urban areas in search of wage employment opportunities(Grimm, 2005). It is a spontaneously form of migration in rural households to search for new land and includes seasonal migration in a dry season and long-term or permanent migration to commercial center(John and William, 1993). Literature also shows that this type of migration is undertaken by poorer groups with little education and other assets as it requires lower investments and it also one focus area of policymakers, urban planner and researcher (Grimm, 2005; Mahama, 2013).

Additional, internal migration includes rural-rural migration from one countryside to another; in many developing countries rural-rural migration is still dominates with laborers from poorer regions traveling to the agriculturally prosperous, often irrigated, areas, which have more work(Grimm, 2005). Urban-Rural migration refers to the movement of people from urban areas to rural areas. It's also called Counter-Urban Migration or Return Migration((Dutta, 2017), majority of urban-rural migrants are returnees(Grimm, 2005). Urban-Urban migration also another form of internal it includes, Movement of a person or a group of persons motivated by economic and welfare needs leads to urban-urban migration. Jobs, better infrastructure like housing, schools(Dutta, 2017) etc. attract people from small town towards metros or big cities. This is more prominent in the developing countries with growing urbanization(Baggio, n.d.; Grimm, 2005).

2.3. Trends of internal migration

International trend of migration shows that; rural-urban migration has become a more common form of coping strategy for many rural peoples to urban areas in search for jobs. The rural-urban migration results due to a rapid industrialization process in urban centers(Dutta, 2017) and it also the most important form of internal migration in developing countries as a coping strategy. For instance, in China people massively migrate towards urban centers driven by urbanization and industrialization(Zhao, 2003), Similarly, in Nigerian rural-urban migration common due to the concentration of public services delivery and wealth in the urban centers as well as degradation

of rural environments or area (Ajaero & Onokala, 2013). Therefore, rural-urban migration have positive impacts on the livelihood of rural household in developing countries, but the current policy situation in several countries restrict this important path to poverty reduction as a coping strategy especially through regulations on population movements and informal sector activities(Grimm, 2005).

Internal migration might be a short to long distance as well as of short to long duration(Baggio, n.d.; Grimm, 2005). However, evidence from the available literature indicates, widespread occurrence of seasonal migration for employment in developing countries. Seasonal migration as a livelihood strategy appears to be the most important coping strategy and accumulation option for the poor and non-poor alike in rural areas (Ellis, 2003). Many rural residents migrate in the slack season to the neighboring cities and elsewhere to find jobs(Ellis, 2003; Parida, 2015).

In recent years, seasonal migration has emerged as a major topic of study because of a large number of socio-economic implications. In fact, it is an important livelihood strategy for a large number of poor rural people in developing countries(Ellis, 2003; Luthria, 2008; Parida, 2015). For example, it is a significant livelihood strategy in India, adopted among the poorest section in rural India, predominantly in the form of seasonal mobility of labor(Keshri & Bhagat, 2010).

Migration literature uses seasonal migration interchangeably with circular, temporal, short-term and spontaneous migration; it has been a subject of much discourse. Researchers and statisticians differ on the definition of seasonal migration in respect to the duration of stay. However, there is an agreement on the fact that seasonal and temporary, in principle, both term refers a movement for a short period with the intention of returning to the place of usual residence. On the other hand, seasonal migration one form of important(Keshri & Bhagat, 2010). Seasonal migration: when the length of stay is less than one year and repeated over time; it is often linked to particular conditions of life and work (farming, harvest, service sector, etc.)(Baggio, n.d.)

2.4. Migration and food security

In recent times, debates on the connection between migration and development raised as vital discourses in contemporary development issues. Consequently, studies on migration and

development have revealed the link between migration and food security. According to FAO, IFAD, IMO, WFP (2018) report on the linkages among migration, rural development, and food security shows a vicious circle of migration and food security, food insecurity as a main driving force of rural people's decision to migrate. At the same time the report indicates poverty, hunger, environmental degradation, and climate shocks, conflict, economic factors and employment opportunities as main causes of food insecurity, and consequently, people often migrate to escape hunger and food insecurity (FAO, IFAD, IOM, & WFP, 2018). Moreover, according to FAO most of the world's food insecure (more than 75%) live in rural areas and are dependent on subsistence agriculture production migrated to an urban area as a response of rural poverty and food and insecurity (Knoll, Rampa, Torres, Molina, & Cascone, 2017).

Food insecurity and resource constraints were key drivers for migration from in Bangladesh and East and West Africa. The remittances help to sustain millions of families globally (FAO et al., 2018; Knoll et al., 2017; WFP, 2018), conversely, rural to urban migration can have negative consequences for agricultural productivity because of rural labor shortages (FAO et al., 2018). According to World Bank, report in 2017 indicates the complex causality of food insecurity and migration in developing countries, food insecurity results of conflict, and when conflict and food insecurity, drive people to migrate, differ from place to place. Conflict, forced migration, and food insecurity can feed into each other, creating a vicious circle for the rural population (WB, 2017). In developing countries, rural-to-urban migration is a common coping strategy of livelihood and it is part of development process, as people migrated to cope seasonal and frequent drought and food insecurity, to benefit from agglomeration economies in the cities (Carvalho & Dünnwald, 2015; FAO et al., 2018).

Furthermore, in African shows that many smallholder farmers in the rural area moving away from rural areas to diversify livelihoods and escape from food insecurity problem due to such as climate change and environmental degradation. Studies in Zimbabwe shows food insecurity as a proximate cause of internal and international migration in the country (Tawodzera, 2016). finding from Uganda, Ethiopia and Nigeria by FAO et al., (2018) shows that, agricultural households have a higher chance of having a migrant compared with non-agricultural ones in Uganda and Nigeria (39% and 29%, respectively), while in Ethiopia environmental shocks have an important

and significant effect on household behavior in the context of migration. In Uganda and Ethiopia, droughts, irregular rains, floods, and other weather shocks increase the likelihood of a household sending a migrant by 34 percent and 13, respectively (FAO et al., 2018, P.35). Moreover, In Uganda, the results suggest that poor and food-insecure households have about 20 and in Nigeria, a poor and food-insecure household is 51% higher probability of sending an internal migrant (FAO et al., 2018, P.35).

In Ethiopia, poverty, food insecurity and a lack of employment opportunities main factors of migration (FAO et al., 2018; Hunnes, 2012). Pieces of literature in Ethiopia indicates rural outmigration closely related with extreme rural poverty and seasonal and frequent droughts. Food insecure people forced to adopt migration as a coping strategy to supplement their income through remittance. Therefore, different studies show rural out-migration common coping strategy for rural poor in Ethiopia, even if it is difficult to get registered internal migration data at national (Hunnes, 2012; Tegegne & Penker, 2016a). At the same time, different reports show 10.2 in 2016, 8.5 in 2017, and 7.95 in 2018 million people are food insecure in Ethiopia (FAO, 2016, 2017a; WFP, 2018). Aforementioned literature sort-out rural poverty and food insecurity as main causes of rural out-migration in Ethiopia.

2.4.1. Indicators/pillars/ of food security

The concept of food security and indicators of food security was defined in various ways by different international, regional organizations as well as development practitioners. Mostly communally used definitions based on based on world food summit the concept of food security was defined as “Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO, 1996, 2006). Accordingly, food security or insecurity of households was being defined or measured by circumstances where the conditions of access, availability utilization of food and stability of the households (WFP, 2015). Therefore, commonly household’s food security status measured by four basic pillars/ or indicators, this section presents the main indicators of food security status.

Food availability: The availability of food shows physical availability adequate amounts of the food supply through national production or imports including foreign food aid in a certain period of time (Hanie, 2013:). This most likely related to the production and the availability(supply) of a sufficient amount of food in the market, either from domestic production or imports (WFP, 2012). Therefore, the food availability of the households is achieved when adequate amounts of food are presented in a country through national production, imports, domestic stocks and food aid(WFP, 2012).

Food Access: the food access indicates the households and all individuals have adequate resources to get proper foods for a portion of nutritious food, The access of household's food is contingent on income available to the household, distribution of food among members of the household and the price of food(WFP, 2012). This is due to the fact that is an adequate supply of food at the domestic or global level does not in itself guarantee household level food security, therefore insufficient food access has resulted due to lack of a policy focus on incomes, spending, markets and prices of the products(Hanie, 2013; WFP, 2012). Most commonly individual and household's access to food is determined by the ability of an individual as well as households to obtain food from own production, purchases, and other sources(WFP, 2009, 2012). Generally, access indicates the capacity of households to economic as well as physical access to food at households or individual level.

Food utilization: this is indicating the appropriate utilization of food requires a diet with adequate energy and necessary nutrients, potable water and sufficient sanitation(Hanie, 2013; WFP, 2012). It is usually considered as consumption of a numerous nutrient in the food, utilization of adequate energy and nutrient consumption by persons is the result of good care and feeding practices, food preparation, diversity of the diet and intra-household distribution of food(Hanie, 2013; WFP, 2009, 2012).

Stability: in order to say a given population, households, as well as the individual, is food secure, it must have sufficient access to adequate food at all times(WFP, 2012). The households or an individual s should not threat losing access to food as a result of unexpected shocks such as economic crisis, environmental as well as climatic crisis or frequent or seasonal food insecurity

problems(Hanie, 2013). The idea of stability incorporates both the availability and access scopes of food security in the households or individuals(Hanie, 2013; WFP, 2012). This dimension of food security indicates the degree to which, households or communities or individuals can survive with and withstand stressful situations and shocks(Hanie, 2013; WFP, 2012).

2.5. Empirical evidence from Africa

This section gives emphasis on empirical studies on seasonal migration, starting with Africa based then followed by Ethiopia cases. through reviewing documents on the experience of countries. Generally, issues covered include selectivity, migration pattern, and causes, determinants and consequences, the linkage between migration and food security and the effect of migration for the livelihoods as a coping and adaptive strategy.

2.5.1. Determinants of seasonal migration

In the context of Africa, migration in general and seasonal migration in particular, plays an important role in improving the socio-economic. Despite the regular occurrence of seasonal migration in Africa, the migration trend is shows a selective process by age, sex, marital status, education, occupation along with some household and communal characteristics such as landholding, number of adult male members, distance(John and William, 1993). Based on this fact, it is hardly to establish a uniform approach to migration patterns applicable to all countries. However, FAO (2015) indicates that 60 to 70 percent of all internal migrants in Africa are males aged between 15 and 34 years, except Malawi, which females are the majority among internal migrantsoreover, studies conducted by Deshingkar and Grimm in developing country including Africa indicates that feminization of migration is a recent change in migration pattern (Grimm, 2005). Many poor countries rural-urban migration still dominates with laborers from poorer regions traveling to urban areas(Grimm, 2005).

Seasonal migration is an important livelihood strategy for poor groups across the world and not just a response to shocks(Grimm, 2005). In Africa, seasonal migration is both a coping and adaptive livelihood strategy for millions of poor people especially the rural people(Grimm, 2005; Shimeles, 2010). Determinant factors of seasonal migration are mainly searching for better employment opportunities, drought, environmental and seasonal based low agricultural

productivity in a rural area (FAO, 2015). For example, in Kenya poorer rural households migrate to urban centers because of poverty and inequality in land access (Oyvat, 2017), and subsistence agriculture, unsuitable agriculture land (Oucho, Oucho, & Ochieng, 2014).

Similarly, in Nigeria rural-urban inequality in the wealth, assets, purchasing capacity, economic activities, and variety of services in the urban centers as well as the continued neglect and degradation of rural environments are the main factors of migration (Ajaero & Onokala, 2013). The same is true for Ghana that population pressure, agricultural land accessibility, low farm incomes, and low agricultural productivity, and food insecurity as the cause of seasonal migration (Mahama, 2013). Furthermore, seasonal rural-urban migration in sub-Saharan Africa countries increases due to occupational diversification, and in South Africa removal of population movement restrictions and good transport networks are the main causes for migration (Grimm, 2005). Additionally, migration assists reduction of poverty, hunger diseases, and human suffering in sub-Saharan African countries, particularly for those from poor areas send remittances to their relatives and families that served as a countercyclical instrument during negative shocks (Shimeles, 2010). African migration trends reflect economic factors as a major force for internal migration both at origin and destination of migrants (Grimm, 2005; Shimeles, 2010).

The findings from the above studies on the pattern and cause of seasonal migration show that young male migrants share the majority internal migration compared to female migrants, particularly, migrating towards urban centers from environmentally fragile rural areas. It is also found that, rural poverty, drought and environmental limits, low agricultural commodity price, population pressure, land fragmentation, poor agricultural productivity, low access to credit, urbanization and better facilities for education, wage and employment in urban areas.

2.5.2. Impacts of seasonal of migration

The literature revealed that determinant of seasonal migration varies from country to country and even within a country because of socio-economic, demographic and cultural variance from place to place. Seasonal unemployment, low income, high population growth, unequal distribution of land, prior migration networks, environmental limits, family size, education status, and food

insecurity has identified as prominent determinants of seasonal migration in Africa (Anglewicz, Vanlandingham, & Manda-taylor, 2017; FAO, 2015; Melesse & Nachimuthu, 2017; Oucho et al., 2014; Oyvatt, 2017). Migration can be as one of the routes out of rural poverty in most of African countries (FAO, 2015; Grimm, 2005). In developing countries, poor rural households resort to seasonal migration to cope from seasonal hunger (FAO et al., 2018). Recently in Nigeria, households remittances are used mainly for consumption (food, clothing) as well as investments in children's education, and food security (Ajaero & Onokala, 2013).

Furthermore, studies conducted by household survey data from six countries across sub-Saharan Africa and Asia showed that, domestic remittances received by poorer households can improve the livelihood of households (Castaldo, et al, 2012). The study shows that rural poverty rates in Rwanda is amongst the worst in Africa, and migration remittances are helping rural families to survive or improve their standard of living (Castaldo et al., 2012). In Ethiopian, remittances obtained from this type of migration, enable rural people to repay debts, buy cattle, and cover household expenditure (Zelege, Asfaw, et al., 2008). It has also a significant contributor to urbanization process, as people move in search of social and economic opportunity (Awumbila & Owusu, 2014). Reports by FAO et al., (2018) on internal migration indicates movement from rural areas to cities is important part of the structural transformation of an economy, and it can bring opportunities for rural economies, remittances received by families, for example, have significant positive impacts on poverty reduction, food security, education, and housing (FAO et al., 2018).

In addition to this, the above-mentioned positive outcome of migration on the livelihood of rural peoples, literature also revealed some of the negative impacts of migration in both the migrants and destination areas of migrants. Such as it deprives agricultural labor areas, increases the prices of commodities, housing, and transport in urban centers, increases the rate of unemployment in urban areas, breaking of family and cultural bond in rural areas, shortage of social services in urban areas due to increasing population. For example, in Ethiopia, and in Sub-Saharan African countries most of the rural-urban migrants affected by transmittable diseases to the family of origin (Asfaw et al., 2010; FAO et al., 2018). Moreover, members of rural societies can have a

negative impact on agriculture productivity, it also pressures on facilities in the destination host town, and pollution of the environment(FAO et al., 2018).

2.6. Empirical evidence from Ethiopia

This section presents reviewed literatures related with determinants of seasonal migration in Ethiopian context, then followed the effects of positive and adverse effect of sessional migration on the livelihood of rural households.

2.6.1 Determinants of seasonal migration

Migration is the common coping strategy of livelihood in the most rural part of Ethiopia, like many developing countries. According to WB report share of the rural population is about 80.08 % in 2016 (percentage of total population) in Ethiopia. Similarly, studies conducted by Hunnes, (2012) showed that 85% percent of Ethiopia's population participates in rain-fed agriculture on plots of land ranging from 0.25 hectares to 2.0 hectare on average, and agricultural productivity also depend on environmental factors(Hunnes, 2012). Therefore, environmental limits decreasing the land's productive capacity and a decrease in subsistence of agriculture income, assets, and a rapid decline in food security status of rural people forced to migration(Gray & Mueller, 2013; Hunnes, 2012). Population mobility in the rural highlands of Ethiopian also result of frequent drought in agricultural and natural resource-dependence of household(Gray & Mueller, 2013). This study also indicates that labor-related migration more than doubled during severe drought season(Gray & Mueller, 2013).

Furthermore, studies conducted by Woldegebriel, (2017) indicate rural peoples form agricultural sectors migrated to urban industrial sector due to lack of substantial income in the agricultural sector(Woldegebriel, 2017). It also shows unmarried and who have no family obligation are more likely to migrate than married(Hunnes,2012; Woldegebriel, 2017). Studies in Amhara region shows that seasonal variation in agricultural activates and environmental problems are causes of migration in the region(Asfaw, Tolossa, & Zeleke, 2010a; Tegegne & Penker, 2016a). Moreover, migration is also dependent on the education statues and family size of households, short-term migration depends on locational advantages and food inadequacy(Tegegne & Penker,

2016a). Households close to commercial cash-crop areas have also locational advantage for seasonal and short-term migration (Tegegne & Penker, 2016a).

Therefore, literature revealed the following factors as the main causes of migration in Ethiopia. such as environmental changes, population pressure, lack of relief assistance, fragmented land holding, absence of nonfarm livelihood strategies, drought, food insecurity, heavy dependence on rain-fed agriculture, unemployment, lack of access to education, lack of access to other public services, indebtedness particular in fertilizer credit, and lack of rural development (Atnafu, Oucho, & Zeitlyn, 2016; Atnafu et al., 2017). The desire to live independently also considered as a driver forces of migration for young people (Atnafu, Oucho, & Zeitlyn, 2016; B. A. Wondimagegnhu & Zeleke, 2017).

Regards to the impact of migration in Ethiopia literature shows that seasonal migration is an ongoing coping strategy of livelihood for rural farmers who depend on rain-fed agriculture; it sources of remittance to support for their livelihood and subsistence (Hunnes, 2012; Tadele, 2004). According to Melesse & Nachimuthu, (2017) migration is necessary part of economic growth, improving income distribution and introducing technological change in agriculture, and they show its role in the context of ensuring human right to improve welfare and economic benefit (Melesse & Nachimuthu, 2017). Seasonal migration also important to diversify household incomes and to cope against various risks in normal and poor agricultural season (Asfaw et al., 2010a). Remittance received from migrant household members used to pay debt, consumption, supplement agricultural income, and other basic needs of the family (Asfaw et al., 2010b; Tadele, 2004). Moreover, different findings also indicate the role of migration in urbanization and rural-urban linkage. For instance, T. Tegenu, (2010) on his study urbanization in Ethiopia indicates, the role of internal migration in development of small towns and urbanization as a form of migration-led urbanization (Tegenu, 2010).

In contrast to the positive impact of seasonal migration in Ethiopia, literature finds out some of the negative impacts of migration on both the origin and destination area of migrants. studies on indicates that peoples migrated to escape from rural poverty, however, domestic and construction workers in the urban area reported that they were still poor and lived in poor conditions once

they had migrated. Studies in Addis Ababa and Bahir Dar shows that skilled and experienced construction workers could earn 100 ETB (5USD) a day while new employees earned around 25 ETB (1.5 USD). In the domestic work sector, skilled cooks can earn more than 1000 ETB (50 USD) per month, Less experienced domestic workers earn as little as 350 ETB (18 USD) per month(Atnafu, Oucho, & Zeitlyn, 2016). In addition to the destination, migration also adverse effect households of the migrants and rural areas. such as many parents left without an assistant and some agricultural land left unutilized and unproductive due to lack labors force in the rural area, loss of social capital(Asfaw et al., 2010a; Melesse & Nachimuthu, 2017;).

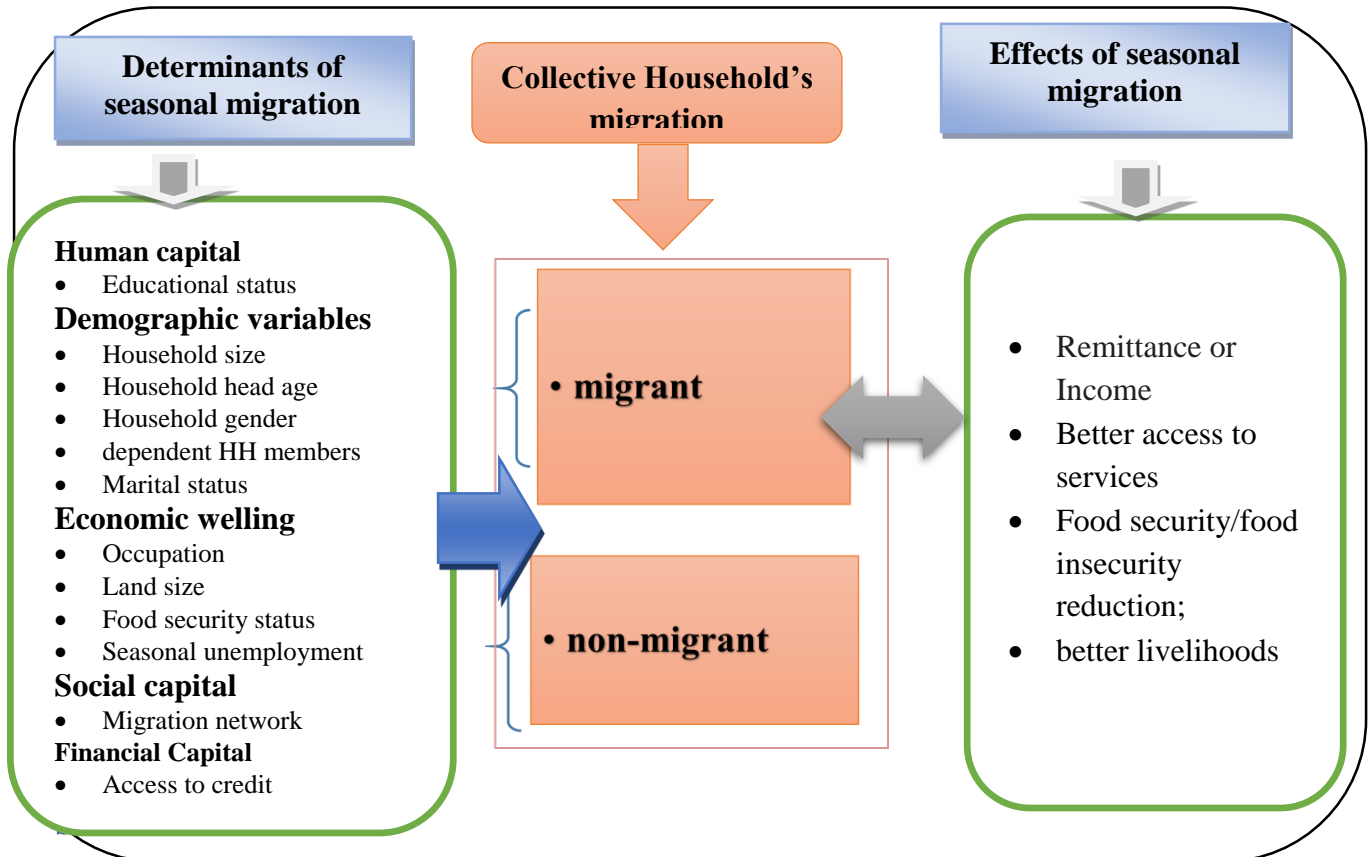
2.7. Conceptual framework of the study

Literature indicates the complexity and diversity of migration in its selectivity, pattern, causes, determinants, and consequences due to changes in place and time. Therefore, scholars have developed different theories and assumptions to explain human migration and its impacts on the livelihoods of migrant and their family or for the broader community. These theories also sort out some factors, determinates at both origin and destination. Some of the theories distinguished based on migration decision, individual decision that depends on individual characteristics, while some theories say it a household decision that depends on family or household, even communal characteristics(Haas, 2015; Massey et al., 1993).This study will employ New Economics of Labor Migration (NELM) model of migration as analytical framework of the studies to examine the determents of seasonal migration and its impact on rural livelihood considering migration as a collective decision of the family or households(Haas, 2015; Massey et al., 1993).

The conceptual framework of the study shows that, different factors related with human capital, demographic, economic, social capital as well as financial capitals are supposed as a determinants factors of seasonal migration in the conceptual framework. Conceptual framework also indicates the above maintained factors influence the collective household decision of migration in the study area. The conceptual framework also shows the impact of seasonal migration on the livelihood of migrant households in the origin area of migrant households. Therefore, in this study seasonal migration is supposed as a household response to income risk and coping strategy, as migrant remittances provide income insurance for households of origin. This risk-spreading motive or determinant of seasonal migration can even explain the prevalence

of migration. Moreover, seasonal migration predicted to bring some changes in the household life and livelihood resulting from seasonal migration affect income or remittance, supplementing agricultural income, food security, and expenditure on other household needs in the sending areas as the impact of seasonal migration as we can see from in (figure 2.1).

Figure 2.1: Conceptual framework the study



Source: Modified from Tegegne & Penker, (2016)

CHAPTER THREE: RESEARCH METHODOLOGY

This section discusses the description and justification of the research methodology, to identify the determinants of seasonal migration and its implications for food security in Tsagibji district. It begins with providing detail information about the study area; followed the research design, and Research approach, in order to give a comprehensive and vigorous perspective on migration and food security. This includes a discussion of the qualitative approach such as unstructured and addition to this quantitative, approach specifically questionnaire. It also discusses sampling techniques in particular, especially random sampling and purposive sampling. Finally, focus on development of data collection instruments, and methods of data analysis.

3.1. Description of the study area

3.1.1. Geographic location of the study area

Tsagibji district is located between 120 23' and 130 16' N latitudes and 38° 44' and 39° 21' E longitudes(Tewodros et al., 2013). Tsagibji is one of the Woreda(districts) in Wag Himra Zone the Amhara Region of Ethiopia, located in the. The district is bordered by Seqota district in the west, Ofila (korom) district in south, by Machew in north and on the east by the Abirgele district. According to the data gathered from District Administration Office the Tsagibji district is situated approximately 760 kilometers far from Addis Ababa north east Ethiopia and 575 km north east of the regional state capital, Bahir Dar.

3.1.2. Population

Based on the data gathered from the district administration the district has a total population of 53,391, of which 29349(54.9%) of were male and the remaining 24,042(45.1) were female. The majority of the inhabitants are Ethiopian Orthodox Christian. The proportion of the population based on the household head of the resident in the district indicated, 7165(78.5%) of households are male headed, whereas 2308 (21.5%) of households were also female headed.

3.1.3 Climate

Environmental and weather condition of the Tsagibji district is characterized by low, variable and erosive rainfall and frequent drought. According to the meteorological data (1994 to 2017) found from NMA of Ethiopia indicates that the average annual rainfall is 548.3, that ranges between 231.2 mm and 870.5 mm. According to the key informant interview with the experts, the area receives rainfall usually onsets in July and stops late of August, its distribution is highly irregular that mostly breaks in late July and early August. Likewise, long term metrological data (1994 to 2017) in (table 3.1) revealed that the area receives 76.4% rainfall in summer season, while the area receives 12.5%, 8.7% and 2.3% of rainfall in Spring, Autumn and Winters season respectively (NMA, 2019).

The district is also frequently vulnerable to environmental induced problems such as natural hazards, droughts and erosive rainfalls that results negative impact on the effect of agricultural activities and livelihood of the of households in the district (Tsagibji District Agricultural Development Office, 2019). Therefore, as naturally vulnerable to insufficient rainfall hence the performance of the Autumn (Mehir) rain has been below normal, erratic and not sufficient with only a few days of rain. Inadequate precipitation resulted in the reduction of both surface and ground water levels leading to a serious shortage of water and food shortages both for human and livestock consumption.

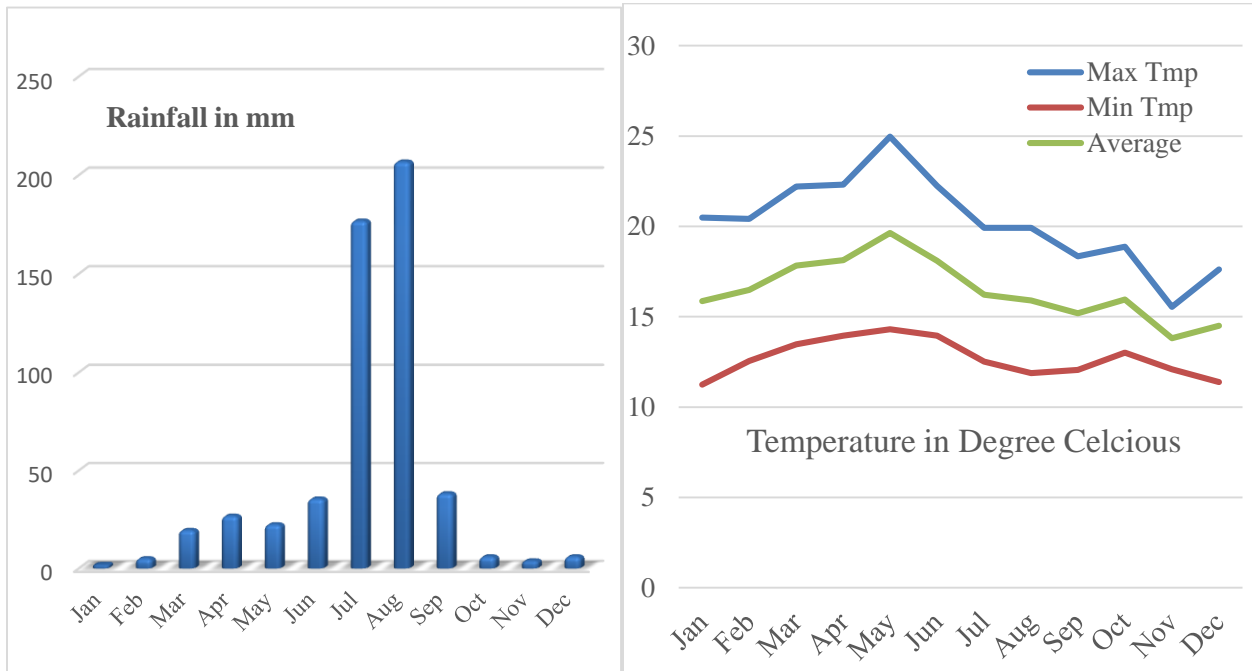
Table 3.1: Long-term annual and seasonal average rainfall in Tsagibii district (1994-2017)

Season	Average Rainfall MM	Percent(%)
Autumn (September, October and November)	47.9	8.74
Winter (September, January & February)	12.8	2.34
Spring (March, April & May)	68.5	12.5
Summer (June, July & August)	418.9	76.4
Total Annual Rainfall	548.3	100

Source: Computed based on raw data obtained from NMA (2019)

The temperature of the study area, the long-term (1994-2017) annual average maximum temperature is computed below (figure3.1) 26.24°C, the annual average minimum temperature is 12.7°C and the average temperature of the study area is found 19.5°C (Figure 3.1).

Figure 3.1: Long-term average monthly total rainfall and average monthly temperature

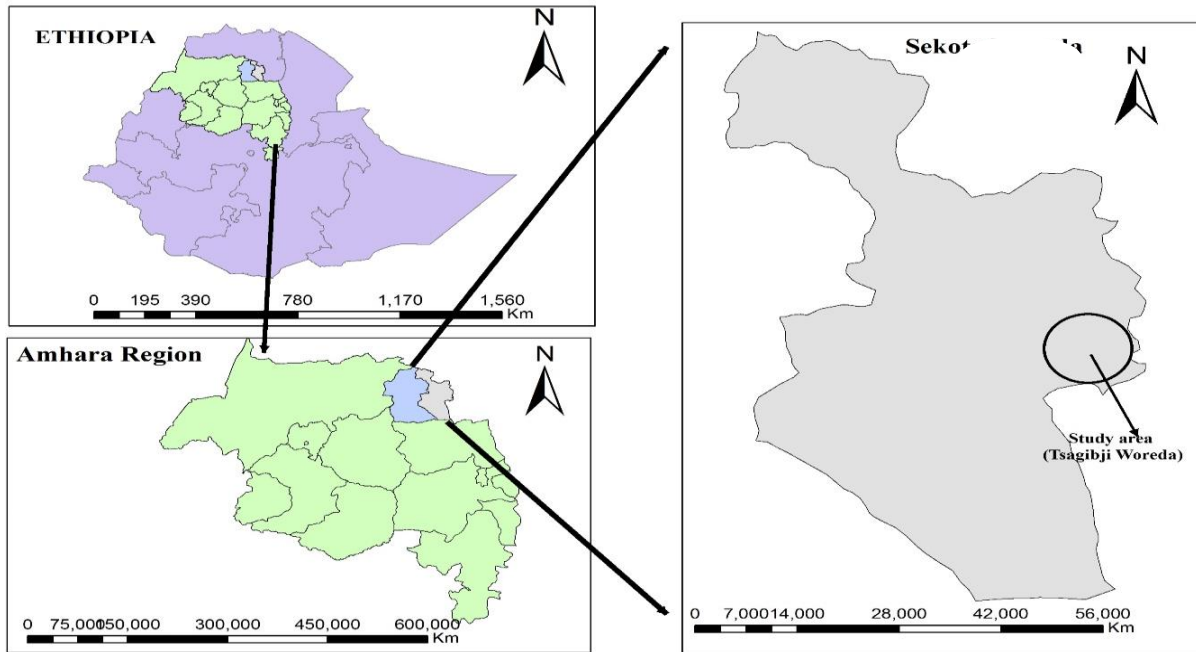


Source: Computed based on raw data obtained from NMA (2019)

3.1.4. Economic and livelihood activities

The livelihood of rural the households in the district depend on subsistence agricultural economy. Agriculture is a main economic activity of the residents in the district, that about 93% of rural households involve in mixed farming (crop and livestock), while only the remaining 7% of households involve in petty trade, government employs, daily laborer, weaving and other economic activities (Getamesay, 2018). Moreover, majority of rural households in the district practices traditional farming system that include as mixed farming (crop production and livestock rearing) (Getamesay, 2018). Adverse impact of climatic conditions, erratic rainfalls and consistent droughts and inadequate utilization of agricultural inputs for drought prone area.

Figure 3.2.: Location map of the study area



3.2. Research design and approach

In order to address the objective of the study, an explanatory research design was employed to identify causality factors that relate to the research problem. In line with this, this study employed a cross-sectional research design, the relevant data would be carried out at the one-time point or over a short period (Creswell, 2003). This design is appropriate to studies that aim to find out the prevalence of a phenomenon, situation, problem, attitude or issue, by taking a cross-section of the population (Kumar, 2011). As these studies involve only one contact with the study population, they are comparatively cheap to undertake and easy to analysis.

The study involved both quantitative and qualitative methods. Quantitative research methods involve systematically or scientifically using statistics, numerals or mathematically centered ways, which are quantifiable for data gathering and analysis. Qualitative is an approach to understanding opinions of individuals or groups (Kothari, 2004; Creswell, 2014), this approach was incorporate to substantiate the findings of obtained via the quantitative survey. Specifically, convergent (Concurrent) parallel mixed strategy was used to investigate both qualitative and quantitative data simultaneously during the same stage of information gathering, and then connects the two data to determine if there are any discrepancies or similarities (Creswell, 2014).

The study begins with collecting both types of data concurrently, analyze two data sets separately, merge the results and interpret combined results.

The main reason to use this mixed research approach is to acquire a better understanding of research problem than either approach alone, and it helps to minimize shortcomings of each approach through integration of the two forms of data and analysis. Moreover, helped for the deep understanding of the connection between migration and food security, a multifaceted link that needed for rigorous research.

3.3. Description of the study participants

According to Kumar (2011), population of a study refers to the entire group of individuals selected for the study. For this study, the population comprised of rural households in the Tsagibji District in Wag Himra Zone. The data was collected from different rural households, such as household with migrant and households with non-migrant, family members of migrant households who stay at home during data collection (husband, child wife or other family members). Furthermore, the research was incorporate some government, non-governmental officials and expertise who are working on migration and food security issues.

3.4. Sampling technique and sample size

Both probability and non-probability sampling procedures were employed to select the sample for this study. Based on this, Tsagibji District is selected based on the vulnerability to seasonal migration and frequent drought. Then, considering the homogeneity of the residents in socio-economic condition and migration practices in the district, this study select two Kebeles randomly from a total 10 Keble's in the district.

Then researcher selected 325 household using simple random sampling technique from 2154 total households in the two Keble. The reason for using probability sampling, specifically simple random sampling is to provide each element in the population have an equal and independent chance of selection in the sample(Kumar, 2011). The researcher use formula developed by Krejcie & Morgan, (1970) was used to determine the representative sample size from given

population from the total households in the two Kebeles. The sample size was proportionally determined for migrant and non-migrant sending households.

Formula
$$S = \frac{x^2 NP(1-P)}{d^2(N-1) + x^2 P(1-P)}$$

$$S = \frac{3.841 \times 2154 \times 0.5(1 - 0.5)}{0.0025(2154 - 1) + 3.841 \times 0.5(1 - 0.5)} = 325$$

S= required sample size.

X2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = population proportion (assumed to be .50 since this would provide maximum sample size).

d = the degree of accuracy expressed as a proportion (.05).

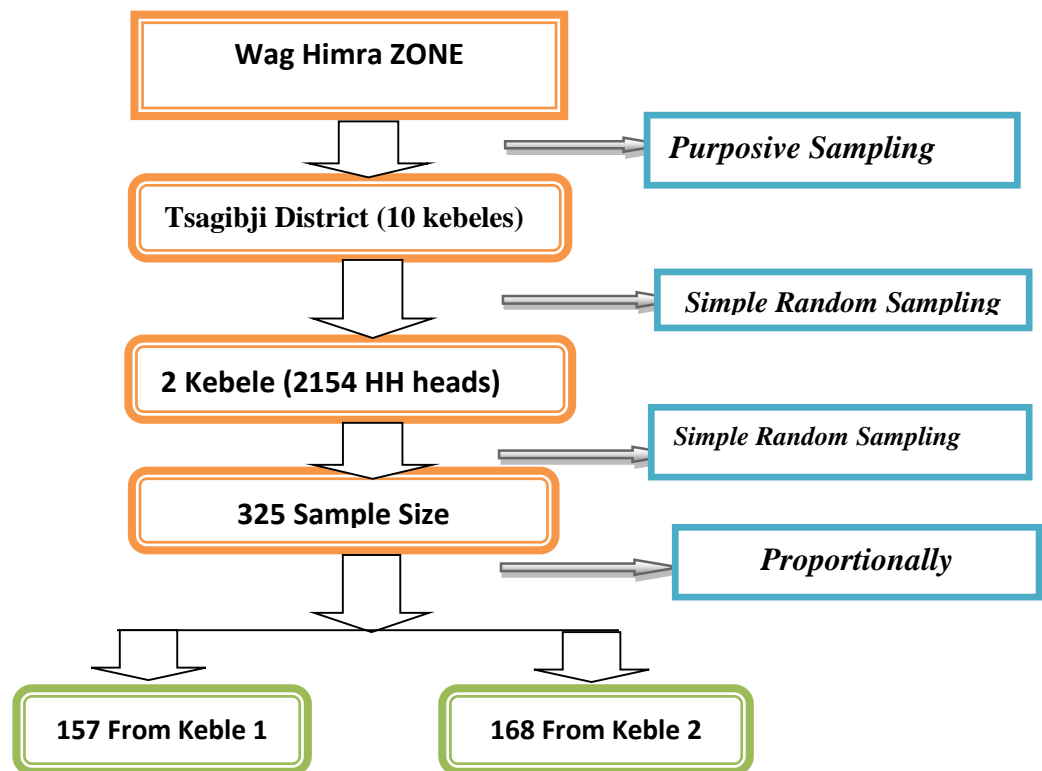


Figure 3.3: Sampling technique

Additionally, selection of participants for the key informant interview KII and Focus Group Discussion (FDGs) was carried out by non-probability sampling through purposive sampling where participants of the study was selected, based on the objectives and interview schedule of

the relevant participant for the both interview and FGDs was selected based on the experience in migration, social as well as religious position, such as a community leader, professional experts and suggested participant by local people, experts and participants in survey. The reason to use purposive sampling is to collect required data from appropriateness sources to describe a phenomenon in depth(Kumar, 2011).

3.5. Sources of data

For the purpose of this, study both primary and secondary data was collected from the relevant data sources primary from rural households using different techniques and secondary sources.

3.5.1. Primary sources

Primary data of the study was obtained from primary sources, Primary sources of data was collected from both migrant and non-migrant households in the two rural Kebeles in the district, Kebele and district government experts and officials. The primary data of the study gathered from rural households using various ways, such as key informant interview and Focus group discussion (FGDs) and household level survey using questionnaires.

3.5.2 Secondary sources

Secondary source of data was collected from publications, articles, books, figures and reports to access studies relate with seasonal migration and food security, frame the study(Kothari, 2004). Therefore, secondary data was gathered from different relevant literature, such as, publications, books, government and non-governmental official documents, annual report on migration and food security by local governmental and NGOs and other stakeholders.

3.6. Methods of data collection

The relevant data quantitative and qualitative data was collected through 325 Household survey using questionnaire, unstructured interviews and two focus group discussions.

3.6.1 Household survey using questionnaire

Questionnaires are widely used method of data collection instrument from a large number of people involved in the research, primarily for the quantitative data to examination using statistics

(Kothari, 2004; Kumar, 2011). The study was conducted using 325 structured questionnaires to gather definite, concrete and pre-determined quantitative data through the household survey.

3.6.2 Key informant interview (KII)

Unstructured interviews were used to conduct interview using open-ended questions. The selection of the respondents was performed through purposive sampling where the respondents were selected based on relevance of the study. Unstructured or depth interview requires little structure at all, and few topics are discussed are covered in detail, and it designed to explore the important reasons and desires of the informant(Kothari, 2004).

Therefore, 15 unstructured interviews were conducted to collect detail data from the informants. The primary aim of unstructured interview is to get in-depth and keen understanding about the topic, allow informants freedom of expression their views in their own terms.

3.6.3 Focus group discussions (FGDs)

The study incorporates focus group discussion to gather qualitative data about the determinants of seasonal migration and its impact on the livelihood and food security in rural migrant households. The data was collected from people with similar backgrounds or experiences together to discuss on the topic, the participants is taken from similar background and experience enhance participant to discuss on the issues openly and in detail. Based on this, two FGDs were conducted in two Kebles to ask the perceptions attitudes, beliefs, opinion or ideas about the topic. The FGDs were organized for nine to eleven participants for decision-making. The participants were selected from the surveyed households, rural local representatives from NGOs & local Government.

3.7. Method of data analysis

The study would use both quantitative and qualitative approaches to data interpretation and analysis. The quantitative data gathered from structured questioners was first-analyzed through descriptive statistics (frequency, percentage and mean). The descriptive statistics was applied to define, simplify and review the data. The presentations of the descriptive statistics were through charts, graphs, tables, tabulations and distribution of frequencies among other things. Then,

inferential statistics was applied in order to understand and make assumptions on the data set under study.

In the study, 15 unstructured individual interviews and 2 FGDs were conducted, through recording and in-depth texts, the data was transcribed and examined to explore the link between seasonal migration and food security. This qualitative information obtained from each respondent and FGDs was briefly presented and outlined through interpreted and triangulated by providing meanings and explanations to the perceptions of the informants so as to dig out issues under investigation and to triangulate quantitative data.

Table 3.2: Techniques of data analysis and indicators

Quantitative data measurement and analysis tool	Indicators
Long-term climate and weather conditions analysis	Stability/sustainability component of food security
Household Food Balance Model (HFNM)	Availability and consumption element of food security
Household Food Insecurity Access Scale (HFIAS)	Access element food security
Binary Logistic regression	Determinants of seasonal migration

A. Long-term climate and weather condition analysis

Measurement of food security status of rural households require a detail enquiry of household's food access, availability, utilization and climate suitability factors, particularly in Ethiopia. Due to disparity of factors that determine the food security situation of rural households in Ethiopia. Therefore, measuring environmental and weather conditions of the study area is very important to understand the food security level of rural households in the study area in environmental suitability context. For this study 23 (1994-2017) year climate and environmental data was gathered from National Meteorological Agency of Ethiopia(NMA) to look at long term vulnerability of the area and climate induced problems in the study area(Gocic et al., 2016; Messay, 2012). The result of this long term climate data was used to determine vulnerability of migrant and non-migrant household's in environmental limits.

Different techniques and data analysis tools were employed to compute the long term climate and weather condition data. Therefore, this study incorporate important useful analysis tools and mathematical calculation for the long term climate data analysis, such as monthly, seasonal and annual mean values, Precipitation Concentration Index (PCI) and coefficient of rainfall variability are which is used by previous studies of (Gocic et al., 2016; Messay, 2012; Woldeamlak, 2009). The precipitation analysis is conducted used to quantifying the comparative distribution of the rainfall patterns through year.

The Precipitation concentration index (PCI) is calculated as follows

$$PCI = \frac{(\sum_{i=1}^{12} P_i^2)}{(\sum_{i=1}^{12} P_i)^2} \times 100$$

Where, P_i is the rainfall amount of the i th month of a year

The following table 3.1 shows the vale precipitation concentration index according (EE, CP, & GN, 2017; Gocic et al., 2016; Messay, 2012; Woldeamlak, 2009).

Table 3.3: Classification of Precipitation Concentration Index (PCI)

PCI Value	Description
PCI<10	Uniform precipitation distribution
PCI 11 to 15	Moderate precipitation distribution
PCI 16 to 20	Irregular distribution
PCI >20	Strong irregularity of precipitation distribution

Long time rainfall variability in the study area was also analyzed by computing the coefficients of variability (CV) of the rainfall values at different time scale. The CV of annual and monthly rainfall variability was calculated for each station using individual year's rainfall (x_i) as follows as indicate in (Messay, 2012).

$$CV = \frac{\sqrt{\sum f(x_i - \bar{x})^2}}{n \bar{x}}$$

Where \bar{x} : Mean annual rainfall in mm
n: number of years for which the rainfall data are available for a given station.
x i: annual rainfall (mm) of the year i of a given station.

B. Household Food Balance Model (HFBM)

The availability food in the study area was measured and analyzed by using Household Food Balance Model (HFBM). Household food balance model is one of important useful tools to present a broad picture of food supply during a specified reference period in a given area or households. Furthermore, it is useful instrument to measure the available (supply) and utilization food at the same time(FAO, 2008, 2017c). The available food for rural households was measured using HFBM, then calculate dietary kilo calories per household and person per day (Messay, 2012). This model has been used in many scientific inquiries to measure household food security circumstances in rural parts of Ethiopia.

The collected data from rural households were calculated and converted into dietary calorie using Ethiopian Health and Nutrition Research Institute (EHNRI) food composition table. The food energy requirement for each household members was weighted by converting it in to Adult Equivalent Ratio (AER) and compared with national minimum calorie requirement level per adult equivalence for Ethiopia (per person per day 2100 kcal). At the same, this study was considering demographic factors of households (age, sex) to compute the adult equivalence ratio of households(AER). In this study modified households balance model formula was used to compute the result(Messay, 2012).

Household Food Balance Model:

$$NGA = ((GP + GB + FA + GG) - (HL + GU + GS + GV))$$

Where,

- NGA = Net grain available/year/household
- GP = Total grain produced/year/household
- GB = Total grain bought/year/household
- FA = Quantity of food aid obtained/year/household
- GG = Total grain obtained through gift or remittance/year/household
- HL = Post harvest losses/year
- GU =Quantity of grain reserved for seed/year/household
- GS =Amount of grain sold/year/household
- GV =Grain given to others within a year

C. Household Food Insecurity Access Scale (HFIAS)

Experience-based food security status of households was analyzed using HFIAS. HFIAS shows food insecurity statuses household's access to food through measuring one-month experiences of household's food security status(Castell, 2015). HFIAS was calculating, and scaling of responses to occurrence of nine questions that shows food security level of households(Coates et,al 2007).

The food security status of the sampled households can be measured using the following HFIAS, then categorizes households into four (4) stages of food insecurity such as food secure, mildly, moderately and severely food insecure based on the responses to the HFIAS survey (Coates et al., 2007). HFIAS indicators provide summary information on: Household food insecurity access-related conditions, domains, scale score, and access prevalence(Coates et al., 2007).

Table 3.4: Household Food Insecurity Access Scale (HFIAS) Measurement Tool

No	Questions: For the last four weeks(one month)	Response	how often
		1. Yes	did this
		2. No	happen?
		Code	Code 1
1	Did you worry that your household would not have enough food?		
2	Were you or any household member not able to eat the kind of foods you preferred because of lack of resources?		
3	Did you or any household members have to eat a limited variety of foods due to lack of resources?		
4	Did you or any household members have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?		
5	Did you or any household members have to eat a smaller meal than you felt you needed because there was not enough food?		
6	Did you or any household members have to eat fewer meals in a day because there was not enough food?		
7	Was there ever no food to eat of any kind in your household because of lack of resources to get food?		
8	Did you or any household members go to sleep at night hungry because there was not enough food?		
9	Did you or any household members go a whole day and night without eating anything because there was not enough food?		

Code 1: How often did this happen

1= rarely (once or twice)

2= sometimes (three to ten times)

3= often (more than ten times)

3.7.1. Model specification

This study used the econometric software to analyze the cross-sectional data and to perform all required tests. The dependent variable of the study is dichotomous; therefore, the researcher used binary Logistic regression model. According to Hyeoun-Ae, (2013) binary logistic regression is part of logistic regression typically used when the dependent variable is dichotomous and the independent variables are either continuous or categorical(Hyeoun, 2013). Therefore, binary logistic regression was used to analyze the relationship between independent variables and a categorical dependent variable, and estimates the probability of occurrence of an event by fitting data to a logistic regression(Hyeoun, 2013).

The logistic probability function (Model Specification) for seasonal-migration defined as the following

$$Pi = \frac{1}{(1 + e^{-zi})} \dots \dots \dots (1)$$

$$Pi = \frac{1}{(1 + e^{-zi})} = \frac{e^{zi}}{e^{-zi}} \dots \dots \dots (2)$$

As shown above, if *Pi* is the household probability to be involved in migration and the probability of households not to be involved in migration, that is, (1 - *P*) is given as follows

$$1 - P = \frac{1}{1 + e^{zi}} \dots \dots \dots (3)$$

therefore, $\frac{Pi}{1 - Pi} = \frac{1 - e^{zi}}{1 + e^{zi}} = e^2 \dots \dots \dots (4)$

Hence, *Pi/ (1-Pi)* is the ratio of a probability that a household is involved in migration to probability that a household is not involved in migration. The following is logarithm equation of logistic regression including the error term(Schüppert, 2009).

$$Ln\left(\frac{Pi}{1 - Pi}\right) = Zi = \alpha + \beta_1X_1 + \beta_2X_2 \dots \dots \dots \beta_mX_m + e_t \dots \dots \dots (5)$$

Where *Pi* = the probability that an individual is migration given *Xi*

Xi= a vector of explanatory variables

α and β = regression parameters to be estimated.

e= the base of the natural logarithm

3.7.2. Description of variables

Dependent Variable

The dependent variable of this study is seasonal out migration of households taken as a study dichotomous outcome as households with migrant household member as 1(one) and households with non-migrant considered as 0 (zero).

Explanatory Variables: Seasonal migration as a dependent variable of the study, it was expected to be predicted by the following explanatory variables;

- ❖ **Age of the household head (AGE):** Age is a continuous explanatory variable. It is hypothesized that the younger the age of the head, the higher the probability for migration(Wondimagegnhu & Zeleke, 2017). Therefore, in this study younger aged households were expected to have more likelihood to migration.
- ❖ **Sex of household's head (SEX):** it is a dummy variable, which takes the value of 1 for male and 0 for female household heads. Female-headed household is expected to have a negative effect on seasonal migration. According to Assfa & Zeleke (2017), male-headed household has a significant and positive effect on seasonal migration than female headed household.
- ❖ **Household Size (HHS):** it is a continuous variable that refers the total number of persons living in a household. For this study, household with large size is supposed to more probability to migration. According Tibebu & Sisay,e (2017) households with high household size have positive relationship with migration.
- ❖ **Dependency Ratio (DR):** Dependency ratio is the rate of inactive labor force (age less than 15 and above 65) by the active labor force (age between 15 and 65) within a household as a continuous variable. Rural household with more inactive productive labor force compared to the current period shows a high dependency ratio, and it is more likely to be migrant than low inactive labor forces (Tegegne & Penker, 2016a; Wondimagegnhu & Zeleke, 2017). For this study, high dependence ratio will be expected to have positive relationship with migration.
- ❖ **Tropical Livestock Unit (TLU):** this variable is a continuous that indicators of wealth statues of households in the livestock and in this study it is assumed that household with lager livestock size are lower the mobility from their place of origin(Tegegne & Penker,

2016a; Tibebe & Sisay, 2017). Therefore, for this study, households with large livestock size are expected less likely to seasonal migration.

- ❖ **Education status of the household head (EDU):** Education is a key for improvement of rural livelihood of households, it is also a dummy variable 1 considered a household can read and write as literate and 0 for households who can't read and write as an illiterate household. In this study, migration is expected to increase among illiterate heads than literate one's household head. According to Assfa & Zeleke, (2017) illiterate household heads are more positive significant relationship with out migration
- ❖ **Land Size(LS):** It is a continuous variable; it indicates the amount of land household owned in hectares. According to Mekonnen, (2011) households with large land size can diversified the agricultural products and less probability to migration. For this study, households with high farmland is expected to have a negative relationship with seasonal migration.
- ❖ **Food security status (food energy in Kcal) (FSS):** it is the binary variable that indicates the food security status of the households taken as food insecure is 0, food secure 1. The food security status of the households are determined based on the computed result from Households food balance Model in Kcal per person per day. According to studies food insecure rural households has positive relationship with migration than food secure households(Tibebe & Sisay, 2017; B. Wondimagegnhu & Zeleke, 2017; Zenaselase, 2017). Similarly, for this study food insured rural households are expected to have a more likelihood to migration than food secured households.
- ❖ **Productive Safety Net Program (PSNP);** It is equal to 1 if household had access to Productive Safety Net Program benefit and 0 otherwise. It is hypothesized that migration is one of the strategies to reduce vulnerability and maximize income in emergencies or crises. access to relief assistance can influence decision for migration. Households who are very poor and received relief assistance have a higher probability to migrate.
- ❖ **Access to credit (CREDIT):** it is dummy variable equal to 1 if household has access and use to credit and 0 otherwise, migration is among the strategies to acquire capital. It is hypothesized that households with access to credit reduce seasonal migration.

- ❖ **Access to extension services(EXTSR):** is a dummy variable 1 for households which have access to credit services and 0 otherwise. In this study access to better extension service is associated negatively with seasonal out migration in the study area.
- ❖ **Access to improved seed (IMPSEED):** access to drought resist improved seed is one main determinant factor for productivity of the farmland as well as seasonal migration decision. It is a dummy 1 for the household that has access and use of improved seed 0 otherwise. Therefore, the study hypothesis household has access to improved seed has a likelihood to seasonal migration.
- ❖ **Fertilizer application (FER):** this is one of the basic variables that determine the migration decision of households in the study area. it is a dummy variable which assumes 1, is household uses fertilizer, 0 otherwise. It is hypothesized household with access or use of fertilizer have negatively associated with seasonal migration.

Table 3.5: Description of explanatory variables

Variable name	Notation	Type	Code /measurements	Exp. sign
Sex of HH head	GEND	Dummy	(Female =0, Male=1) 1 reference for all	+
Age of HH head	AGE	Continuous	Number	+
Household size	HHS	Continuous	Number	+
Educational status	EDU	Dummy	Can't read and write 0, Can read and write 1	-
Dependency Ratio	DR	Continuous	Number	+
Tropical Livestock Unit	TLU	Continuous	Number	-
Farm Land Size	FLS	Continuous	Number	-
Land fertility	FER	Dummy	Fertile,1 and less fertile 0	-
Access to PSP Benefit	PSP	Dummy	Yes 1, No 0	-
Total income	TINCO	Continuous	Number	-
Distance from market	DCM	Continuous	Hours	+
Food security status	FSS	Dummy	Food insecure 0, food secure 1	-
Fertilizer application	FER	Dummy	Yes 1, No 0	-
Extension services	EXTSRV	Dummy	Yes 1, No 0	-
Number oxen owned	OXEN	Continuous	Number	-
Access to credit	CREDIT	Dummy	beneficiary1, non-beneficiary 0	-
Improved seed	IMPSEED	Dummy	Yes 1, No 0	-

CHAPTER FOUR: RESULTS AND DISCUSSIONS

This chapter presents the research findings of the study organized in to four main sections. Accordingly, 52% of the sampled households are seasonal migrant, while 48% of sampled households are non- migrant, moreover, 42 % of the sampled households were found food insecure, while 58% of the sampled households were food secure. In the same way, form migrant sampled households 57% are food insecure, whereas 43% are also food secure. Then the first section describes the demographic, socio-economic and institutional characteristics of sample households in the study area with cross tabulation. The second section reports the motivational factors, trends, practices of seasonal migration, and effects on livelihoods sampled households in the origin area of migrants. Third section discussed about food security status of household, which is computed from household food balance model(HFBM), long term climate, precipitation and weather condition analysis and Household Food Insecurity Access Scale (HFIAS). Finally, result for determinants seasonal migration are computed using econometric model.

4.1 Descriptive statistics

4.1.1. Demographic characteristics of sampled households

The description of demographic characteristics of the sample households is important for validation of the study results in demographic context of sampled households Therefore, the following, section illustrate the descriptive analysis of demographic characteristic of households. such as age, household size, sex, and marital status.

4.1.1.1. Age and household size

The average age of the total sample household heads was 39.19 with standard deviation of 8.64. The mean age of the sampled household head was 37.8 and 40.6 years for migrant and non-migrant respectively. The t-test result showed a significance difference in age between migrant and non-migrant households at 1% significant level (Table 4.1). This might be attributed to that most of migrates household members from rural area work as daily laborers in destination area. the young aged a migrant the more economically active labor force, this result is similar with earlier studies with (Zelege, et al., 2008) who found young aged peoples are more seasonally migrated in Ethiopia.

The average household size of the sampled households was 6.12 with standard deviation of 1.22(Table 4.1). Similarly, the average household size of migrant and non-migrant households was 6.14 and 6 respectively. The t-test resulted there is no statistically significance between household size and seasonal migration. The mean household size for both migrant and non-migrant households is above on average households size of rural households in Ethiopia (5.1 people) and average household size in Amhara region(4.4 peoples) (CSA, 2012). This finding is consistent with (Tegegne & Penker, 2016b) they found average household size 6.6 which is above on average households size of rural households in Ethiopia.

Table 4.1: Test descriptive statistics for continuous demographic variables (t test)

Variable	Migrant		Non migrant		Total		t-value
	Mean	Std. Dev.	Mean	Std. Dev	Mean	Std. Dev	
Age	37.83	8.13	40.66	8.95	39.19	8.64	2.99***
HH size	6.14	1.21	6.09	1.25	6.12	1.23	-0.34

Note: *** and ** significant at 1% and 5% significant level.

Source: Field survey result, 2019

4.1.1.2. Sex and marital of household head

From the sampled households in the survey, 74 % (households) were male-headed and 26% of households were female-headed, similar to the total households head proportion of household head in Ethiopia, which is 75% male headed and 25% female headed households in general as well as specifically, 78% male and 22% female headed in all rural households in Ethiopia (CSA, 2012). Therefore, chi-square test approved that, there is statistically significant association between sex of the household head and household migration status at a significant level of 1% (table 4.2).

The frequency of migrant male head household was higher than female head migrant households. Among 169 migrant household heads 136 (80.4 %) of them were male head household, while 33(19.6%) of the respondent were female headed households. This is because of the effect of gender on the livelihoods of rural community through customary practices (social classification)

economic, social and institutional responsibilities, access and ownership of recourse and other activities for male and women in the study area. This results similar with studies conducted by Woldegebriel, (2017) who found that the share of male migrants is greater than female migrants in Ethiopia. In contrast to this, the result is inconsistent with the finding of (Wondimagegnhu & Zeleke, 2017)they found that majority of migrant were female headed in northeast Ethiopia. This implies that migration in general and particularly, internal migration in Ethiopia is gender selective, specifically in this study area.

Table 4.2: Test descriptive statistics for categorical demographic variables (χ^2)

Variables		Migrant (N=169)		Non migrant (N=156)		Total (N=325)		Chi ² value
		N	%	N	%	N	%	
Sex of HH head	Male	136	41.85	105	32.31	241	74.15	7.3364***
	Female	33	10.15	51	15.69	128	25.85	
Marital status	Married	128	39.38	131	40.31	259	79.69	4.3551
	Divorced	28	8.62	14	4.31	42	12.92	
	Widowed	13	4.00	11	3.38	24	7.38	

Note: *** and ** significant at 1% and 5% significant level.

Source: Field survey result, 2019

Regarding the marital status, about 79.6 % of the sample households were married whereas 12.9 % and 7.38% of the sampled household heads were divorced and widowed respectively. The chi-square result disclosed that, there is no significant association among marital status of the sample household and migration statuses of the sampled households in the study area.

4.1.2. Socio-economic characteristics of households

Socio economic characteristic of the sampled households is important determinant factor for seasonal migration in general and particularly in Ethiopia and Amhara region. Thus, this section briefly presents the socio-economic indicators of seasonal migration in the study area.

4.1.2.1. Dependency ratio of sampled households

The proportion of economically inactive labor force (age less than 15 and above 65) and economically active labor force (age between 15 and 65) is important to understand the dependence ratio of the sampled households. The average dependence ratio of whole sampled households was 1.53 with standard deviation of 0.88. In terms of migrant and non-migrant households the dependency ratio was 1.51 and 1.55 respectively (table 4.3). The t-test result revealed no statistical significant difference in mean of dependency ratio and migration statuses of the sampled households in study area. This implies that the mean difference of dependence ratio of among migrant and non-migrant sampled household is almost equal. This finding is consistent with study by Tegegne & Penker, (2016).

Table 4.3: Test descriptive statistics for continuous socio-economic variables (t test)

Variable	Migrant		Non migrant		Total		t-value
	Mean	Std. Dev.	Mean	Std. Dev	Mean	Std. Dev	
Dependency ratio	1.52	0.89	1.55	0.87	1.53	0.88	0.36
Land size	0.675	0.66	0.96	1.08	0.8125	1.05	11.58***
TLU	2.5	1.63	5.3	2.15	3.818	2.36	13.3***
Total income	7953.8	1912.7	8665.8	2715.7	8295.6	2356.3	2.74***
Distance from market	2.25	0.707	2.256	0.74	2.25	0.72	0.0245

Note: *** and ** significant at 1% and 5% significant level.

Source: Field survey data, 2019

4.1.2.2. Land size and tropical livestock unit (TLU)

Land as one of basic assets that determine the productivity and economic capacity of the rural inhabitants in Ethiopia. Furthermore, land size is one of the critical factors, which determine seasonal migration in the Amhara region, particularly in Tsagibji district. The average land size of the sampled household was 0.8125 hectare with standard deviation of 1.054 (table 4.3). The result is below average farmland size per household in Ethiopia (0.95) hectares (CSA, 2014). The mean land size of non-migrant households comparably higher than migrant households with average land size of 0.95 hectare and 0.67 hectare of farm land respectively (table 4.3).

Therefore, average result of non- migrant households equal with the national average result of cropland size, whereas the average farmland size of migrant household is low compared to non-migrant households and average total farmland size per households in Ethiopia. This infers that rural households with low farmland are vulnerable to poverty and food insecurity situation in the study area, and enforced to adopt seasonal migration as a livelihood strategy.

Additionally, the livelihood of rural people in Amhara region in general and particularly in the study area is dependent on the livestock as an asset of households next to land. The survey result in (table 4.4) depicts that 87.9% of the sampled households have their own livestock including oxen, while 12% of the sampled households in the study area have no livestock. The chi-square result in (table 4.4) indicated a statistically significance association among having livestock and migration status. Moreover, the mean tropical livestock unit of sampled households is 3.8 with standard deviation of 2.36. The average TLU of non-migrant and migrant households was 5.27 and 2.5 respectively (table 4.3). The t-test result ratified that, there is statistically significant difference in TLU of migrant and non- migrant households at 1% significance level. This might be because of owning livestock and high tropical livestock have impact on the productivity of the agricultural and economic capacity and migration decision of sampled households.

4.1.2.3 Annual income

Annual monetary income of households from crop sale, livestock and livestock product sale, off farm activities, remittance, migration, Productive Safety Net Program (PSP) and other financial sources can play a substantial role in influencing the migration decision of households in the study area. The survey result disclosed that average annual income of sampled households was 8295.6 ETB birr with standard deviation of 2356.3 ETB birr, whereas mean annual income of households with migrant and non-migrant was 7953 ETB birr and 8665 birr respectively (table 4.3). The t-test result indicated that there is significant difference between annual income of migrant and non-migrant sampled households in the study area at 1% significant level (table 4.3). This might be due to the trend of economically insufficient households are imposed to seasonal out migration to cope from income deficits from the agricultural sector.

4.1.2.4. Main economic activity of the households

Economic activities (occupation) of rural households and economic level is basic motivational factor of migration in developing countries, particularly in Africa and Ethiopia economic plays an important role in internal migration. In Ethiopia poverty and low economic status situations in most of rural part enforced to adopt migration as livelihood strategy. However, poverty or economic issue is not necessarily the main motivational factor for seasonal migration in Ethiopia, Migration decision the interconnected with other factors such as social, cultural and institutional factors of rural households. Accordingly, the survey result from origin area shows that, the livelihood of 85% of households were dependent of mixed subsistence farming both crop and livestock, whereas livelihood 10%, 3% and 2.1% of sampled households were dependent only on farming, petty trade and laborer respectively (table 4.4). The survey result revealed significant association in occupation of migrant and non-migrant sampled households. This result indicates that the main livelihood strategy of respondent households is dependent on the subsistence agricultural activities.

Table 4.4: Descriptive test statistics for categorical socio-economic variables (χ^2)

Variables		Migrant (N=169)		Non migrant (N=156)		Total (N=325)		Chi ² value
		N	%	N	%	N	%	
Main Occupation	crop& livestock	132	41	144	44	276	85	13.89***
	farming only	25	8	7	2	32	10	
	Petty trade	8	2.5	2	0.6	10	3	
	Laborer	4	1.23	3	0.9	7	2.2	
Education	Can read and write	23	7	45	13.8	68	20.9	
	Can't re and write	146	44.9	110	33.8	256	78.7	11.6***
Livestock	Yes	134	41.4	151	46.6	285	87.9	25.09***
	No	35	10.8	4	1.2	39	12.	
Food security	Secured	72	22.2	115	35.4	187	57.5	32.14***
	Insecure	97	29.8	41	12.6	138	42.5	
PSP	Yes	143	44	104	32	247	76	
	No	26	8	52	16	78	24	10.92***
Land	Yes	121	37.2	145	44.6	266	81.8	
	No	48	14.8	11	3.4	59	18.2	24.89***
Oxen	Yes	87	26.8	148	45.5	235	72.3	
	No	82	25.2	8	2.5	90	27.69	76.28***

Note: *** and ** significant at 1% and 5% significant level.

Source: Field Survey, 2019

4.1.2.5. Educational status of households

The survey result in educational status also indicates that of 79% of the respondent household heads were illiterate (can't read and write), while 21% can read and write. According to CSA (2012) literately rate in Ethiopia is 48.3%, so the literacy rate in the study area is below national literacy(CSA, 2012). The literacy rate among 68 literates (can able to read and write) household heads 66% of respondent non migrant with compared to 34 % of literates (can able to read and write) households (Table 4.4). Moreover, to this, chi-square test presented significant association between educational status and migration status of the sampled households at 1% significance level (Table 4.4).

4.1.2.6. Landholding and access to Oxen

The livelihood activities and strategy of most rural population in Ethiopia depend on access to own land. As, land is a basic asset of livelihoods in rural part of the country, and Amhara region, likewise landholding is basic asset for the study area in particular. The productivity of agriculture sector depends on the size, fertility and ownership of land. Furthermore, seasonal variation of land productivity due to decaling of the land fertility, drought, lack of rainfall, infestation by pest, and shortage of farmland are basic determinate factors which influence migration decision of rural residents in the study area.

The comparison of the own land landholding pattern among surveyed rural households at origin area of the migrants in (Table 4.4) depict that 81.8 % of the sampled households had their own farm land, despite to this, 18 % respondents of households have no own farm land. From 18 % of land less households, 16% of households use shared land, while 1.54 % of household's use rented. The chi-square result in (Table 4.4) significant association between the landholding of migrant and non-migrant of the sampled households at 1% significant level.

Furthermore, Oxen is in the study area about 72.4% of the sampled households own Oxen, while 27.6% of had no own oxen. At the same time, from sampled households who have no Oxen about and 25.2% were migrant, while 2.4% of are migrant households. As oxen is an important asset for rural households in Ethiopia, especially for rural farmers which the livelihood is depend on the traditional farming system using oxen. The survey result reveled a significant association

in the having Oxen of migrant and non-migrant sampled households (Table 4.4). Therefore, the result indicates the share of migrant households they have no own Oxen is higher than non-migrant households, this might be due the fact that owing own farm oxen to plow their land cropping time improve the output of cropping, at the same time it might be reduce the probability of seasonal out migration of sampled households.

4.1.2.7. Productive Safety Net program (PSNP) and food security status

Benefit of relief assistance (PSNP) is one of the coping livelihood strategy of rural peoples in study area, as vulnerability of the district in both chronic and frequent food insecurity problems. Substantial number of households frequently food insecure, and not able to produce adequate food for their annual consumption due to lack of rainfall, droughts, shortage of sufficient land, and other environmental factors. Therefore, food aid PSNP can play vital role the livelihood of rural residents and at the same time it determines migration decision of households. Accordingly, from the entire sampled households 77.2% of were beneficiary relief assistance and while the remaining 22.8 % of sampled households.

Accordingly, from 251 relief assistant beneficiary sampled households 34% of households benefited from direct Productive Safety Net Program support, while 24.3% and 18.7% of benefit relief assistance from public work PSP and emergency food aid programs in respectively. The chi-square displayed statistically significant association between relief assistance beneficiary of and migration statues households in the study area. This might be due to fact that productive safety Nat programs and other emergency food assistance supplement the availability of food in the study area in addition own agricultural productivity, as result this might support the rural households to sustain in their home and reduce seasonal migration.

According to Tsagibji District Rural Development Office the total relief assistance beneficiary in 2019 is 12859 peoples, according to this data almost 25% of population in the district dependent on the relief assistance program to complement their subsistence agricultural livelihood. Therefore, relief assistance plays a significant role in reducing number of seasonal migrants in the study area.

Likewise, literatures revealed that food security status of rural households is the most important determinant factor, which affect migration decision of households in rural parts of Ethiopia, particularly in the study area. Out of the total sampled household, 187(57.54%) of them were food secured, while 138 (42.46%) were found food insecure. The survey result in (Table 4.4) indicates 57% of migrant sampled households were food insecure, whereas the remaining 43% of the sampled households were found food secure. This shows that, from the sampled migrant households more than half of the sampled migrant households were food insecure.

The chi-square result indicated a significant systematic association in the food security status of migrant and non-migrant sampled households at 1% significant level (Table 4.4). This might be because of the direct impact of food security on the migration decision of the sampled households. According to the key informants interview with local agricultural development officer's in the two kebeles household with large family size, small plot of land and food insecure are more enforced to seasonal migration. The return from agricultural activity is not sufficient to feed their household and other basic need of their family.

4.1.3. Institutional characteristics of sampled households

Important institutional characteristics of the respondent households to describe the migration status of households is discussed the following, distance from market, access and use to fertilizer, improved seed, credit and extension services.

4.1.3.1. Distance from the market center

The result shows that, each Kebele has one nearest market centers on Monday and Saturday. According to key informant farmers, farmers in both two kebeles sell their products in the nearest two market centers due to lack of road facility that link kebeles with urban centers and town. The result in (Table 4.1) depict that the mean distance from market center of the sampled household was 2.25(two hours and fifteen minute) with standard deviation 0.723. mean distance of migrant and non-migrant households was almost the same with mean of 2.254 and 2.256. the t-test result also disclosed there is no significant difference between the mean of distance from market center and migration status of households.

4.1.3.2. Access and use to credit and extension services

Access to credit from private or government financial institutions can play a decisive role to improve the productivity and the livelihood of rural households in Ethiopia. It is used as an alternative and coping livelihood strategy in the rural households in the study area. In the same way, the role of extension services has a vital role in improving the agricultural output and the livelihood of rural households in the Ethiopia and particularly in the study area.

The survey result in (Table 4.5) disclosed 52% of households had no access to credit services, whereas 48% sampled households reported access and use credit services from financial institutions in the district, from those households who have access and use of credit services 12% and 36% of the sampled households are migrant and non-migrant sampled households respectively. The proportion of non-migrant sampled households who have access and use of credit services is higher than migrant sampled households. Based on the key informant interview with farmer in the district the main sources of financial credit in the study areas is Amhara Credit and Saving Institution S.C. The chi-square result in (Table 4.5) showed a significance association in the access and use of credit services between migrant and non-migrant sampled households at 1% significant level.

This result implied that there is a systematic association in the access and uses of credit services among migrant and non-migrant sampled households in the in the study area. this is might be the fact that access and use of credit services increase investment capacity of farmers in the agricultural sector and in return to credit services has a progressive impact on agricultural yield. Fundamentally, access and use of to credit services allow rural households for livelihood diversification, improved food security and overall improvement of livelihood. Furthermore, the key informants identified that households who are relatively economically poor and had not a collateral asset for credit services are more imposed to seasonal out migration in the study area.

Agricultural extension service is critical issue for rural households which dependent on agricultural livelihood strategy and economy, it helps transfer farm technologies, supply new improved seed and new farming system for farmers. Regarding this, from the total sampled households only 34% of sampled households had adequate access and uses of extension services,

whereas, the majority 66% of sampled households has not access an extension services. Among 66% of the sampled households who have not access and use of extension services 46.8% of sampled households were migrant, while 19.4% sampled households are non-migrant (Table 4.5). The chi-square test also indicated a significant systematic association between the access and use of extension service and migration status at 1% significant level (Tabele4.5).

This implies from the sampled household's majority of households were found that no access and use of extension service more enforced to seasonal migration in the study area. This manly because of the extension services contributes an important role to increase agricultural productivity as well as food security of the sampled households, at the same time it might be reduce numbers of seasonal migrants in the study area.

Table 4.5: Descriptive test statistics for categorical institutional variables (x^2)

Variables		Migrant (N=169)		Non migrant (N=156)		Total (N=325)		Chi ² value
		N	%	N	%	N	%	
Credit access	Yes	40	12.3	116	35.7	156	48	83.51***
	No	129	39.7	40	12.3	169	52	
Extension service	Yes	17	5.2	93	28.6	110	33.9	88.97***
	No	152	46.8	63	19.4	215	66.2	
Fertilizer use	Yes	14	4.3	86	26.5	100	30.8	83.56***
	No	155	47.7	70	21.5	225	69.2	
Improved seed	Yes	22	6.8	61	18.8	83	25.5	29.03***
	No	147	45.2	95	29.2	242	74.5	

Note: *** and ** significant at 1% and 5% significant level.

Source: Field survey result, 2019

4.1.3.3. Access to agricultural input supply (fertilizer and improved seed)

In Ethiopia the majority of population is inhabited in rural part of the country and the livelihood of rural population depends on the productivity and the intensification of agricultural sector. Therefore, adequate, timely and suitable supply of agricultural input (fertilizer and improved

seed) is one of the critical factors, for the agricultural productivity of the area. likewise, it has an immortal role in influencing the migration decision of rural households in Amhara region, particularly in study area.

Concerning the access and use of agricultural inputs, the survey result showed that the supply and use fertilizer is very limited, only 30.7% of the sampled households have access and utilize farmland fertilizer, while the remaining 69.3% of the sampled households reported no adequate access and use of fertilizers. The survey result revealed that there is a significant association between the access and use of land fertilizer and migration status at 1% significant level (Table 4.5).

Accordingly, the share of non-migrant sampled households to access and use of land fertilizer is greater than migrant sampled households with 26.5% and 4% in respectively. This denotes that the number of migrant household with access to fertilizer input is limited due to different factors. According to key informant and FGD the proportion of migrant in access to fertilizer is limited due to the fact that some of migrant households have no own farm land or limited farmland size, they are also economically insufficient to spend on agricultural inputs, and rainfall variability in area are considered as basic factor for low access and utilization land fertilizer in the area.

Furthermore, access to improved seeds was only 26.1% of respondent households have access to improved seeds, while the majority of respondent households (73.8%) had access no access to improved seed. The chi square test also disclosed a statistically significant association between the access to improved seed and migration status at 1% significant level.

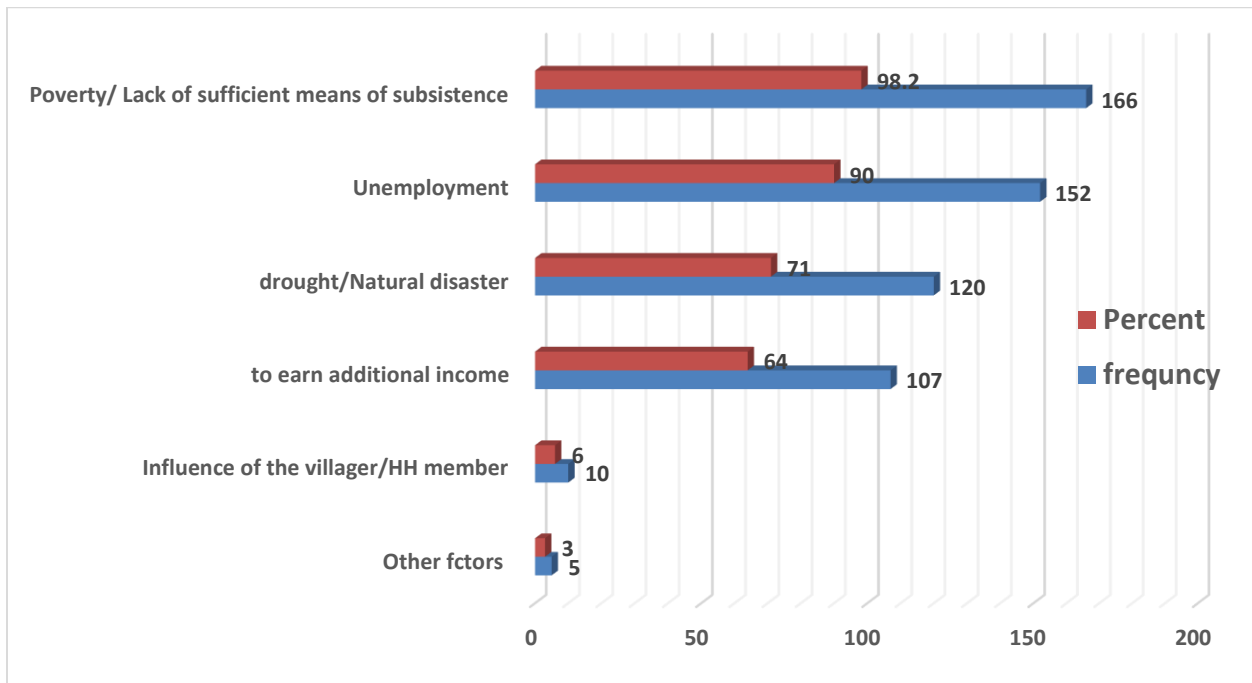
4.2. Migration as a coping strategy of livelihood

This section, discuss the motivational factors of seasonal migration as adaptive livelihood stagey for different environment extremes, and frequent droughts. Followed by the practice and seasonal migration such as sources of information, destination area of migrants, and, finally the effect of seasonal migration on livelihoods of migrant households is discussed.

4.2.1. Push factors and causes of seasonal migration

The findings revealed that, the trend of seasonal migration and main motivational factors for migration vary from place to place in general and in particular from household to household in the district. Even if people in the district are not migrant due to single motivational factor, but multiple determinant factors enforcing people to adopt migration as an adaptive livelihood strategy. Accordingly, the result in (figure 4.1) below shows that from the entire sampled migrant households 94 % of indicated poverty and lack of sufficient means of subsistence as a main and first motivational factor for migration and 86.7%, 68.6% and 61.1% of the households were responded unemployment (search of job), earning additional income and drought/Natural disaster rank as second, third and fourth push factors for migration. While, 5.7 % and 2.8 % of sampled households were rank influence of the villager and household member and others factors as fifth and sixth motivational factor migration.

Figure 4.1: Frequency distribution of push factors of (multiple responses)

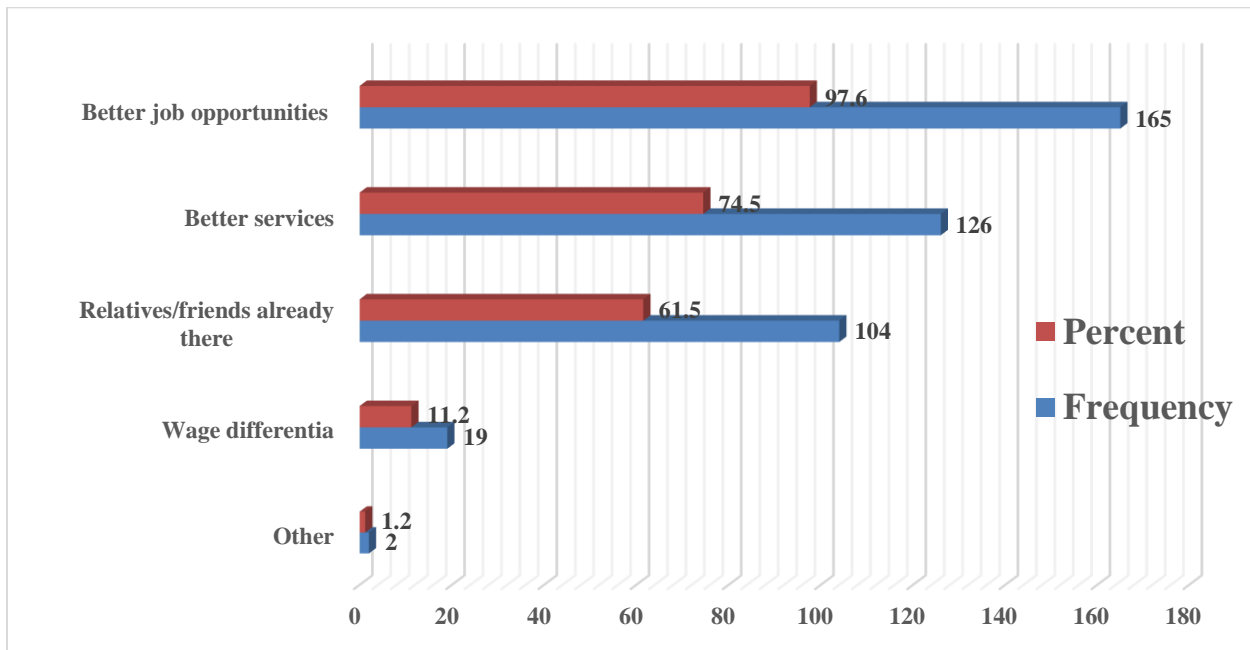


Sources: Field Survey, 2019

On the other hand, the push factors in the origin area of migrants socio-economic, educational and access to better services are pulling factors for migration in Ethiopia. and particularly seasonal migration in destination area. Regarding to the pull factors which affect seasonal

migration, the survey result (Figure 4.2) disclosed that, with multiple responses 97.6% of the sampled households ranked search for a better job opportunity as the first pull factor for seasonal migration, 74% and 61% of households ranked better services in destination areas and relatives or friends in destination area as a second and third pull factor of seasonal migration respectively. whereas only 11% and 2% of sampled households were ranked labor wage difference and other related push factor as fourth and fifth factor of seasonal migration in the study area.

Figure 4.2: Frequency distribution of pull factors for seasonal migration (Multiple responses)



Source: Field survey, 2019

The above survey result (figure 4.2) discloses that almost the majority of households migrated for reason of economic factors and adopt migration as a means of adaptive livelihoods strategy to economic problems, such as the existence of extreme poverty and lack of sufficient means earning for subsistence livelihoods, unemployment and droughts and natural disasters and employment opportunities and better access to services. The result is consistent with studies conducted by (G. Zeleke, et al., 2008; Atnafu, Oucho, & Zeitlyn, 2016) lack of sufficient means of subsistence and poverty, earning additional income and employment opportunities in Ethiopia. According to the KII with migrant households, and group discussions the main reason for seasonal migration is declining of agricultural returns and productivity from time to time for last

the two and three decades. The lack of sufficient seasonal rainfall in the area, declining soil fertility over time, environmental degradation and natural disasters influence agricultural productivity of the area and as result resident in the area enforced adopt seasonal migration as a responses and livelihood strategy.

Furthermore, KII experts and FGD with participants identified following factors as a main reason for seasonal migration in Tsagibji district. Therefore, lack adequate rainfall, rainfall variability and uneven of distribution rainfall in summers season spill most rural inhabitant's in consistent vulnerability in environmental extremes, drought and natural disasters. As a result, due to frequent occurrence of the problem in the area a number peoples suffered by lack of sufficient means of subsistence, shortage of adequate access to food, and basic needs in the post-harvest season, the households migrated after the post-harvest season.

Regarding the environmental extremes data from District Rural Agricultural Development Office shows that, many people are annually encored to migration due to shortage of rainfall and irregularity and erosive rainfall distribution in the area. According to the data in 2018/19 production year more than 500 households were vulnerable in in different environmental limits, especially shortage of rainfall, flood, and ice.

Therefore, results from the survey and the interview suggest that extreme poverty and lack of sufficient means of subsistence in the agricultural due to rainfall variability, uneven distribution of rainfall and other the environmental factors are the basic factor for migration decision in the study area. The following figures 4.3 indicates the impact of the environmental extremes on the agricultural farm land of households in 2018/2019 production year, as indicated above in this production year more than 500 households ware vulnerable to erosive rainfall, flood and other environmental hazards in the district.

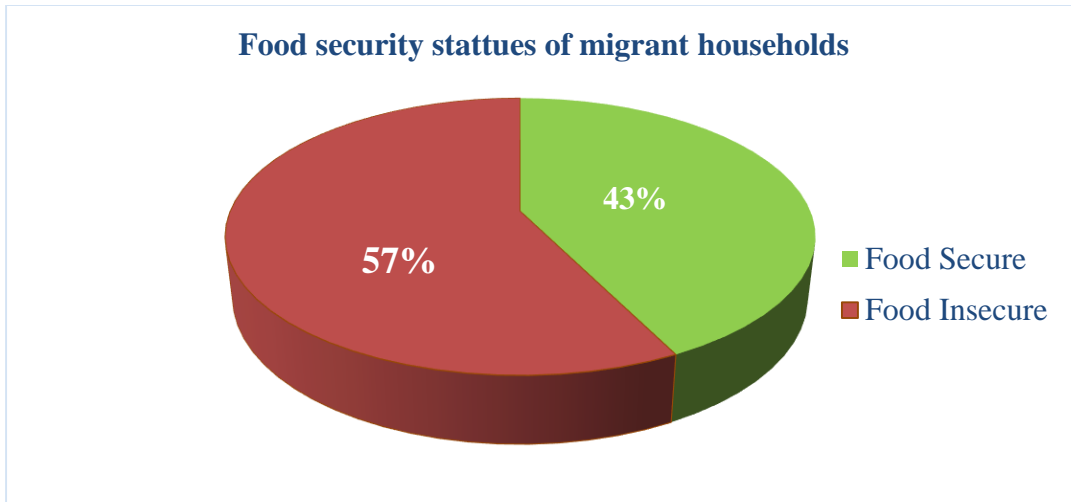
Figure 4.3: Impact of erosive rainfall and environmental limit on agricultural productivity



Sources: From District Rural development office in 2019

In addition to the aforementioned problems in the area there is a vulnerability to frequent shortage of food insecurity problems, drought and famine in Ethiopia. According to Sen, (1981) since the 1970s famine in the northeast Ethiopia, the area is still vulnerable to frequent food insecurity situation and drought in Ethiopia. The survey result also disclosed that, the migrant households 57% of the respondents were food insecure, whereas the remaining 43% of respondent households were found food secure (figure 4.4). This means majority of the migrant sample households were food insecure and it implies food insecurity status is one of the contributing factors for seasonal migration in the study area.

Figure 4.4: Food security Status of migrant households



Source: Field survey, 2019

On the other hand, other social-economic factors such as high indebtedness of households, high interest rate of financial loans and shortage of farmland is other causes of seasonal migration in Tsagibji district. According to the KII households who borrowed loan from the Amhara Credit and Saving Institution S.C were unable to pay the debt due to declining the agricultural productivity from time to time and the rate of high interest rate of loan (19%). The FGD result also revealed that shortage farm land is other driving force migration, especially majority of youths in the district have no own farm land.

Moreover, social and cultural attitude of the society towards migration and extravagant recourse utilization for different social festivity can play an important role in shaping migration decision of households. According to FGD participant the recent trend of seasonal migration shows usual livelihood strategy, previously migration has been considered as a practices of poorest households, however, recently attitude of the people toward migration is changing and they consider as an essential livelihood strategy. Therefore, change in social and cultural attitudes of the household in the district is also other contributing factor to increment of seasonal migration in the area.

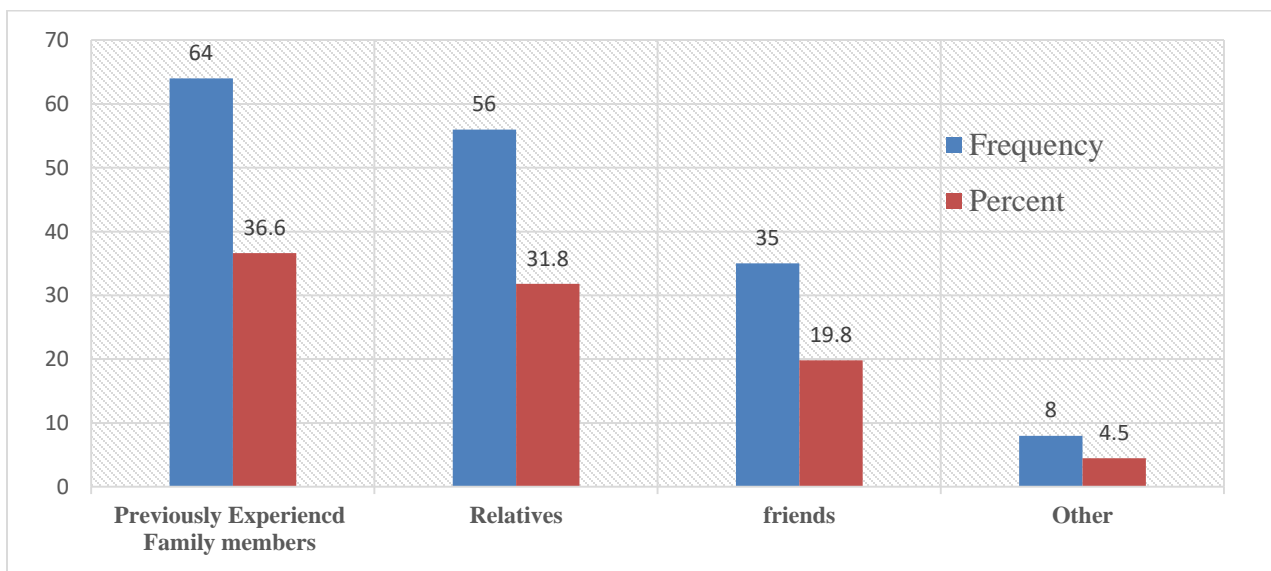
Finally, low infrastructural development of the area on basic service such as education, health center, road, and other basic facility enforce the rural residents to live in vicious circle of poverty

and annually enforced a substantial households enforced to adopt seasonal migration. The key informant and FGD participants argued that marginalization of the are infrastructural development impose people for better services and employment opportunities.

4.2.2 Sources of information about the destination area(networks)

According to network theory information flow and social networks such interpersonal, friendship and kinship ties both in origin and destination of migrant can play a vital role in shaping and sustaining migration(Massey et al., 1993). Therefore, access to information and migration networks is important determinants factor for migration. In this study, from the total sampled households 92.5% of migrants had access to sources of information about the destination and migration area before migration. This study incorporates, previous experience, relatives, friend, and others sources as the main sources of information for migrant households. As presented in figure (4.5), 36.6% of migrant household’s accessed from experienced family members, 31.8 % from relatives, 19.8 % from friend, and 4.5 % of respondent’s access from others sources. According to the survey result majority of the migrant households gained information about migration and the destination area often from previously experienced family members.

Figure 4.5: Sources information about destination and migration



Sources: Field survey, 2019

4.2.3. The main destination area of seasonal migrant

Migration practices and trend can vary from place to place and destination. Therefore, livelihood of migrant household members in the destination area depends on access to employment opportunities, potential resources, socio-economic activities and availability of other opportunities in destination. The result from the origin area indicates that, from migrant households 32%, 23%, 20.1% and 11.8% of migrant household numbers migrated to Bahir Dar, Mekelle, Raya Kobo, and Dese respectively. While, the remaining 6%, 4.8 %, and 2.4 % were migrated to Debre-Berhan, Woldiya and Addis Ababa respectively.

Thus, figure shows that the main destination area for migrant household was around Bahir Dar, Mekelle, and Raya Kobo. The result also indicates that migrants largely migrated from rural-urban more than rural-rural migration. The key informant interview households with of the study also indicated the trend of seasonal migration is usually adopted strategy of livelihood in circumstances of droughts, environmental extremes, shortage of rainfall and food insecurity in the area, but practices, destination areas, season of migration and purpose of migration is change over time. The key informant also indicates that, before 10 and 15 year peoples migrate towards agriculturally productive rural such as Bellssa, Mettema, Humera and agriculturally the productive areas of Raya Kobo to work as s daily laborers in agricultural sector. However, the recent trend of migration has changed in different ways, such as peoples migrated towards from rural-urban destinations, especially in last five and ten years almost all migrant is migrated towards urban centers, such as Bahir Dar, Mekelle, Raya Kobo, Dese and other urban centers including the capital city of Addis Ababa.

Moreover, according to the participants of the FGD, the purposes of migration changed overtime, previously migration was taken as the only strategy for the problem of food insecurity, droughts, environmental limits and there was such positive attitude towards migration. However, recent trend show migration is not only coping strategy for such problems, but also migration was adopted as an alternative strategy for livelihoods to earn addition income, supplement subsistence agricultural economy, and considered as usual practices for both poor and rich households. Therefore, recent experiences of migration indicate that, main destination area for majority of migrant household from the district was towards urban centers.

Table 4.6: Frequency distribution of destination area of seasonal migrants

Destination Area of Migrants	Frequency	Percent
Bahir Dar	54	32
Mekelle	39	23
Raya Kobo	34	20.1
Dessie	20	11.8
Debre Berhan	10	6
Wolidya	8	4.8
Addis Ababa	4	2.4
Total	169	100

Source: Field Survey,2019

4.2.4 Effect of seasonal migration on household’s livelihoods.

This section discusses the effect of seasonal migration on the livelihoods of migrants, the possible impacts of migration, major purposes of the earnings from migration, the contribution of migration in the livelihood strategy of the migrants. Furthermore, the negative effect of seasonal migration in the place of origin presented.

4.2.4.1 Positive effect of seasonal migration

The result revealed that seasonal migration has a positive impact on the household’s availability to food through migration, increase the consumption, improve food security condition, decreasing vulnerability to different frequent droughts and poverty situation and supplement the subsistence agricultural livelihood of rural households, furthermore, migration is also a means of earning additional income.

As discussed adapting seasonal migration as an adoptive livelihood strategy migration has its own positive and negative effect on the wellbeing of rural households generally and particularly in the study area. Based on the findings from the KII with household’s seasonal migration had a positive effect on the migrant household members.

The households indicated that seasonal migrations contributes significantly as a means of survival strategy for substantial number of household Tsagibji district. People migrate to different destination in agricultural slack season to reduce the burden of their family at home and to cover other basic costs of the households in home and at the same time save resources in their home for the summer season. According to the New Economics of Labor Migration (NELM) theory, seasonal migration is used as coping strategy of livelihood for the poorest segment of the society from situation of droughts and food insecurity and basically, seasonal migration is not the only alternative mechanism of livelihood, but it an necessary livelihood strategy to minimize risk and shocks for poor rural household(Kurekova, 2011; Massey et al., 1993; Thieme, 2007).

Furthermore, migration as an alternative means earning of additional income for rural households in the study area. Based on the respondent in FGD discussion some of rural resident in the district migrate to generate additional income through migration, especially after post-harvest period mostly youth in district migrate to urban centers like Bahir Dar, Mekelle and other urban center to work as a daily work in the destination. According to the KII in the study area mostly number peoples which migrated for purpose of to earn additional income is very few compared to households that migrated due to poverty. Likewise, Neoclassical theories of migration household which migrated to earn additional income were benefited from the return of geographic difference in labor supply and demand, in rural and urban centers and wages between labor-rich versus capital-rich areas(King, 2014; Massey et al., 1993; Todaro & Smith, 2011). Therefore, seasonal migration is one of the alternative livelihood strategy households supplement their subsistence agricultural income.

In line with this interview and FGD discussion in the above, the survey result regarded the effects impact of seasonal migration in household indicators through Likert scale responses in the below (table 4.7) showed that from the entire sampled migrant households 47% and 51% households responded strongly agree and agree in respectively, migration increased frequency of meal in household. Moreover, 74% and 20.7% of the sampled migrant households confirmed, agreed and strongly agreed, migration can improve food security condition their households respectively, whereas only 4% and 1% of sampled migrant households responded undecided and

strongly disagree with the effects of migration in improving food security of their households respectively.

Regarding the effect of migration in improving the occupation of the migrant households only 3.5% and 21% of the sampled migrant households responded strongly agree and agree respectively, whereas 39%, 21% and 14.8% of the sampled migrant households replied undecided, strongly disagree and disagree respectively, migration can't improve their occupation (table 4.7). From sampled households 23.6%, 20% and 14.8% of households replied undecided, strongly disagree and disagree that migration can't help them to construct tin roof house in respectively, only 17% and 1.7% of sampled migrant households were responded agree and strongly agree on this issue respectively, this implies that, the seasonal migration in improving housing condition of the migration very low.

Literature revealed that migration has an important role in improving the livestock size of rural households. The empirical finding in (table 4.7) also shows 5% and 24% of sampled the households were replied strongly agree and agree with migration has increase number of livestock size respectively, whereas 16%, 30% and 26% of sampled the households responded undecided, strongly disagree and disagreed that migration had no any effect on the livestock size of households.

In addition to the aforementioned indicators migration can attribute a vital role in refining housing conditions and number of rooms in the households. The survey result disclosed that 2%, and 21% of the sampled migrant households responded strongly and agree respectively (table 4.7), and conformed that migration has an important role on the increase numbers of rooms. In contrary to this, 13%, 30% and 28% of the sampled households replied undecided, strongly disagree and disagree respectively, which indicted migration has no positive effect in increasing the number rooms.

The above figure indicated migration can play an important role in increasing the frequency of meal, improve food security condition, decreasing vulnerability of households from different frequent droughts and poverty situation and supplement the subsistence agricultural livelihood of rural households. Conversely, majority of sampled households respond undecided about the

effect of seasonal migration in improve or change their occupation. The result in (table 4.7) revealed seasonal migration attribute a minimum role in improving the housing condition and increasing livestock size of households.

Table 4.7: Effect of migration on different household indicators (Perception-based)

No	Different Household Indicators	Strongly Agree	Agree	Undecided	Strongly disagree	Disagree
1	Migration can increase frequency of meal in my household	47.34	51.48	0.6	0.6	
2	Migration can improve food security condition my households.	20.7	73.96	4	1	1.8
3	Migration can improve or change my occupation.	3.55	21.3	39	21.3	14.8
4	Migration helps us to construct tin roof house.	1.78	17.75	23.67	36	20.7
5	Migration can increase number of livestock size	5.92	24.26	16.57	30.18	26.08
6	After migration I have increase numbers of rooms	2.37	25.44	13.6	30	28.4

Sources: Field survey, 2019

4.2.4.2. Negative effect of seasonal migration

In contrast to the above, seasonal migration can also resulted a negative impact on the livelihood of households and other livelihood activities in the origin area of the migrants, such as in reduce agricultural yield due to labour migration, school dropout, isolation from social life, traffic accidents and another moral impact.

Based on the KII with experts and FGD participant the main negative impact of seasonal migration on livelihoods is during winter season lobar force is shifted from rural agricultural towards urban centre, people stayed in their home are ever old aged peoples, females and children, therefor they are not physically active for agricultural activities like active labour forces. Due to this reason agricultural productivity for the next season decline due lack of labour force to preserve the fertility of land before rainy season. This can result a consistent poverty and less productivity of households and enforced resident for migration. Furthermore, household's

members are isolated from social life and capital at home such as family, relatives, friends and other social institutions and. Both migrant household members and families at home are isolated from their social capital such as holidays, festivity and other social issues.

Nature and effect of seasonal migration is context dependent as well as selective by sex, gender and age of migrant households. The study result revealed that children are a mainly migrate with the family, or stayed at home. The KII interview result with experts and school directors indicated children are vulnerable for adverse effects of seasonal migration practices in two ways. First, a substantial number of children are dropout from school because of migrated with their households, then, households use children's for supplication activities in urban areas, therefore, due to migration in each year a large number of children in district are dropout from school. On the other hand, the FGD result reveals that children who are not migrated with their family are also responsible for different agricultural activities including keeping livestock and other activities, even they are responsible to keep livestock of their relatives due this reason child who are not migrated also still dropout from school.

Moreover, migrant household members especially children are vulnerable for traffic accident in the urban area, as the KII identified the due to unfamiliar with destination area mostly migrant households are died due to traffic accident in Addis Ababa, Bihar Dare and Mekelle. Therefore, seasonal migration has the following negative impact of livelihood of households and migrants such as shift of agricultural labour force from rural-urban area, substantial number children are dropout from, migrant households especially, children are vulnerable to traffic accidents and another moral and psychological impact.

4.2.4.3 Purpose of migration income or remittance

Migrant households use migration income for different livelihood activities and purposes, In the same way, the survey result disclosed that the mean migration income of migrated households which earn from was 2775.14 ETB birr with standard deviation of 1200.08, the minimum and maximum of 1000 ETB birr and 7500 ETB birr respectively. as KII households identified that migration income used this different purposes, mainly households use income for purposes of purchasing of food grain for summer season, because rural households were live in extreme

poverty and inadequate amount of food in their store. Only some of rural households use migration income for purpose of improve and construct iron roofed house through saving three or two-year migration income.

Furthermore, as discussed in the FGD seasonal migration have vital role in improving the access to agricultural inputs and in covering basic expenditure of their households, such as to purchase cloths, food crop, seeds and other agricultural inputs, pay debts loans, buy livestock, cover holiday expenses and cover a household's medical costs. To understand the use of migration income in the origin area, the following Likert scale survey result in (table 4.4) present the frequency of household's response for different purposes which used the migration income or remittance in the study area.

Concerning with migration income 45%,50.5% and 4% of respondent use migration income always, very often and sometimes in respectively, for purposes of purchasing food grains. While 18% and 72% of respondent households use always and very often for purposes pay debits in respectively, whereas 5%, and 3%of respondent were use sometimes and rarely for purposes of repay debts. The frequency result also indicated that only 0.6% and 31% of respondent were use always and very often for purposes to buy cattle respectively, while 25%, 10.5 and 31.7% of households were use sometimes, rarely and never use to purpose of buy cattle in respective frequency. Form entire sampled migrant households 1.2%, and 16% respondent households were respond always and often use migration income to improve and construct a house in respectively, while the remaining 14%, and 21% of respondent were use migration income sometimes and rarely to improve and construct a house in respective frequency. whereas 46% respondent never use migration for this purpose (table 4.7)

Moreover, 6% and 18% of migrant households employed migration income always and very often to agricultural inputs and seed in respective frequency, while the 16.5% and 16.4% of sampled migrants use sometimes and rarely for agricultural inputs in respective frequency rate and the remaining 42 % of migrant households indicated that they can never use migration income for agricultural inputs. On the other hand, 22.4% and 16 of migrant households confirmed that always and very often they use migration income for purpose of other livelihood

activities, while 10% and 7% of the households were use sometimes and really migration income for purpose other livelihood activities in respective frequency rate. Whereas the remaining 42 % of respondent never use migration income for purpose of other livelihood activities (table 4.7).

This result also shows that the migrant households in the district are very poor and mainly they use the migration income for the purpose of basic livelihood activities of their households such as for purposes of purchase food grains, repay debts, buy cattle, especially oxen for farming activities, to improve housing condition, agricultural inputs and other basic livelihood activities.

Table 4.8: Frequency distribution of purposes of migration income among households

Use for purposes of	Frequency%				
	Always	Very Often	Sometimes	Rarely	Never
1 Migration income to purchase food grains	45.	50.5	4.1		
2 Migration income to repay debt	18.3	72.1	5.3	3	1.18
3 Migration income to buy cattle	0.6	31.1	25.8	10.5	31.7
4 Migration income to construct/improve house	1.2	16.4	14.1	21.1	46.4
5 Migration income to purchase agricultural inputs	5.9	18.2	16.5	16.4	42.3
6 Migration income for other activities	22.4	16.4	10.6	7.6	42.9

Sources: Field survey, 2019

4.3. Measuring the household food security status

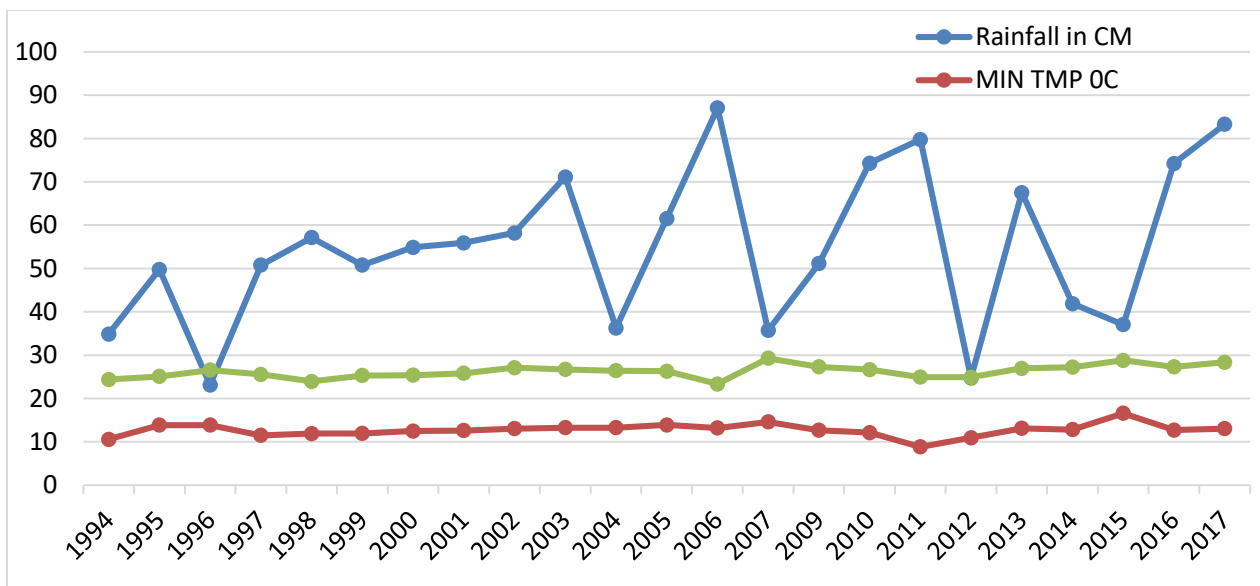
The availability food, consumption, access and sustainability aspect of the household food security status was computed by using different techniques. The result that the characterized by low rainfall, high PCI value and rainfall variability. The HFBSM revealed 58% of the sampled households were found to be food insecure, while 42% of households were food secure, further 57% of migrant households were found to be food insecure. The HFIAS indicated 60% of the households were food secure, while, 23%, 15% and 2% were mildly, moderately, and severely food insecure. Finally, MAHFP, showed that on average for 1.94 months the sampled households suffered from shortage adequate provision of food within a year

4.3.1. Long-term climate and weather conditions analysis

Measurement result of long term climate and weather conditions of the study area shows that the mean annual rainfall received in study area between year 1994 and 2017 year was 548.3 mm with standard deviation of 15.16814. This indicates the annual rain rainfall is below 1000 mm per year imply that the area is very scarceness of the area for agricultural practices as indicated(Messay, 2012). The minimum annual total rainfall of the study area for the last two decades was 231.2 mm (in1996), while the maximum value is 870.5 mm (in 2006) (Figure 4.6). The coefficient of variation for the over the 23 years' rainfall data is 2.7% with standard deviation of 15.16814, Therefore the variation rainfall data though year is slightly variable (less rainfall variability) but the area is receiving extremely low annual rainfall, the study is also one of drought prone and rainfall scarceness area in Ethiopia in general and particularly in Amhara region. The average minimum and maximum temperature of the study area is 12.72 and 26.24 °C respectively, with standard deviation of 1.5 and 1.51 respectively.

Based on the findings the annual total rainfall of the study area is less than 1000mm, this result is consistent with the previous studies about annual rainfall variability in this region by Woldeamlak, (2009) who found annual rainfall variability to be less than 1000 mm in Lalibela that is very nearest with study area.

Figure 4.6: Trend of average annual rainfall (mm) and temperature in °C

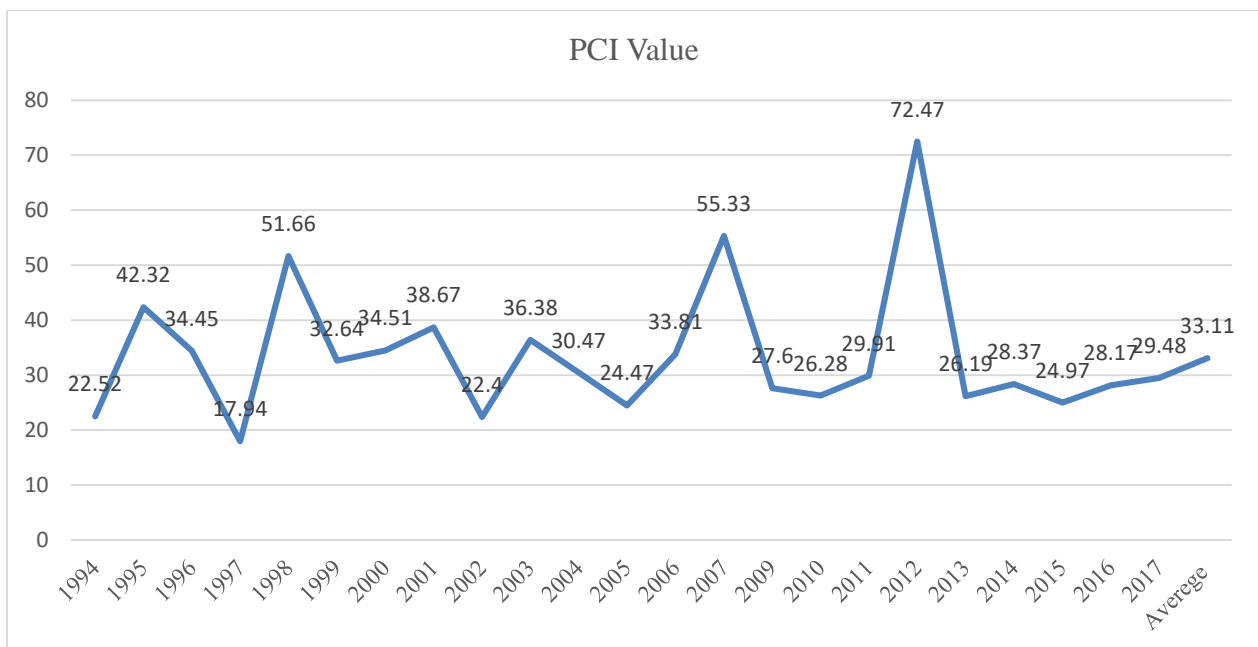


Source: Computed based on raw data obtained from NMA, 2019

The Precipitation Concentration Index analysis result in figure (Figure 4.7), shows the mean PCI value in the area is 33.5 has indicates that the precipitation in the area is highly concentrated in few months in the year with standard deviation of 12.274. The analysis in the figure indicates extremely highest PCI value was recorded in 1998, 2007 and 2012 year with 51.6, 55.3, 72.47 PCI value respectively, whereas, the 1997 and 1994 was the period when minimum PCI was period when the PCI value was about 17.95 and 22.52 percent respectively.

Precipitation Concentration Index (PCI) output in (figure4.7) indicated, the relative distribution of rainfall is high concentration on the few months in the years. As a result, the highest PCI value was recorded in 2012, This indicates the rainfall distribution is almost concentrated on one month only (August), on the other hand in this year the study area had not get to rainfall for the nine up to ten months. The overall result figures and average PCI value of the area shows that the rainfall distribution concentrated for the few month and the result also shows that there is high inconsistency of rainfall distribution year to year and Rainfall distribution is very irregular, there is also unpredictable rainfall distribution in the study area. PCI result is inconsistent with previous studies Woldeamlak, (2009) who found PCI values ranged from 17 to 27 percent in ANRS and the findings of(Messay, (2012) who found PCI vale 15 16.4 percent in Oromiya.

Figure 4.7: Precipitation Concentration Index (PCI)



Source: Computed based on raw data obtained from NMA, 2019

Furthermore, the key informant identified the agricultural productivity of the area is declining from time to time due to lack of sufficient rainfall, variability and irregular of distribution rainfall in the area. Similarly, participants in FDG confirmed that the district receives erratic or insufficient rainfall for rural agricultural livelihood of rural residents. They also indicate that the area is received consistent precipitation in the summer season for the last one and two decades.

Moreover, in the study the rainiest month was July and August, whereas the area receives heavy and unpredictable rainfall in August. the informant identified the recent rainfall variability in the summer season is one of the main challenges for agricultural practice, the district receives precipitation less than two months, which means the rain starts in mid of July up to mid or end of August. Therefore, the precipitation in the summer season is not only inconsistent and variable over the years, but also the rain is not sufficient for agricultural practices of the rural households that is depend on subsistence agricultural livelihood strategy. Similarly, according to information from Wag Himra Zone Food Security Office the district is one of precipitation scarce, frequent drought prone and food insecure areas in the Amhara region, particularly, in Wag Himra Zone. Therefore, lack of sufficient precipitation, rainfall variability, unpredicted heavy and erosive rainfall trend in Tsagibji district is determinant factor for the long term trend of extreme poverty, food insecurity and seasonal migration practice.

4.3.2. Household Food Balance Model(HFBM)

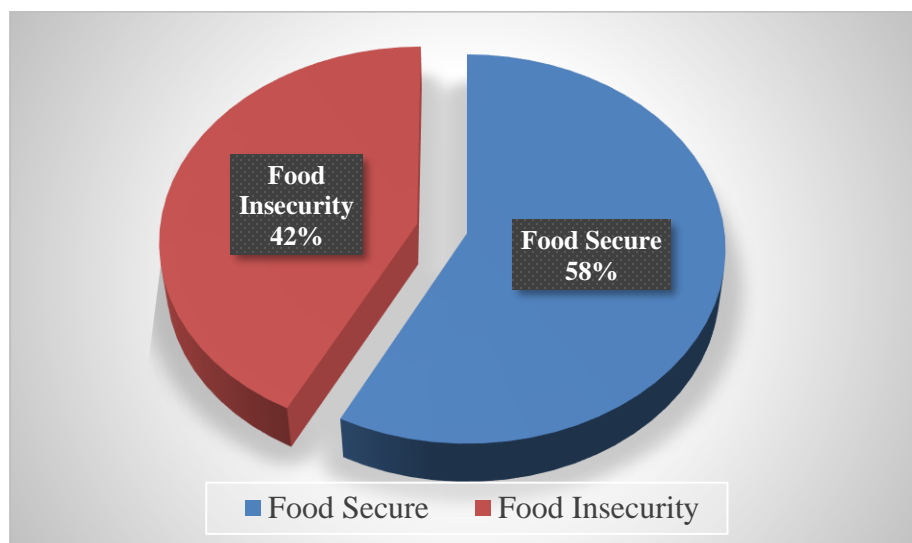
Households food balance presents a comprehensive picture on the pattern of food supply during a specified reference period in a given area or households. Its useful tool to measure the amount of food that is physically available(supply) and utilization of food in the given area or households(FAO, 2008, 2017c). In this study, the food security status or the available food for human consumption was measured using household food balance model, this model is important to calculate dietary kilo calories per household and person per day.

Therefore, to calculate and analysis HFBM in this study, dominantly produced cereals such as *Teff, Barley, Maize, Sorghum, Wheat, Bran and Chickpea* were used as the main sources for food consumption in the district, the study incorporated only annual product which is produced in 2018/2019(February,2018-January,2019) production year. The collected data were calculated

and converted into dietary calorie using Ethiopian Health and Nutrition Research Institute (EHNRI) food composition table see (Annex1).

The computed HFBM result in (figure 4.8) shows that 42 % of the sampled households from the district were food insecure per person, per day, while the 58% of households were food secure. The computed HFBM result indicates that 42% of the sampled household unable to get adequate dietary kilocalorie.

Figure 4.8: Food security statues of households in Kcal per person per day



Sources; Field survey result, 2019

4.3.2.1. Description of food availability in the study area

The descriptive statistics result of dietary energy availability in kilocalories in (table4.9) shows that, the mean food availability of food secure and food insecure households have 1903.7 kilo calories per person per day and 3282.8 kilocalories per person per day respectively. This indicates the of shortage availability of food energy to considerable proportion of the population in the area.

However, the computed result of HFBM shows that the overall average food energy availability is 2697.2 Kcal per person per day, higher than the national value (2100kcal). Furthermore, household's food energy availability was found within the range of 730 to 9266.6 Kcal with

standard deviation of 1074.641 and 0.398428 coefficient of variation. This implies that there is large gap in energy availability among the sampled households.

Table 4.9: Household dietary energy available expressed in Kcal per person per day

HH Food Balance Model Equation	Food Secure	Food Insecure	Description of Statistics of Data for the study area					
			Mini	Mean	Maxi	SD	CV	Total
Total gain from produced	3574	2242.9	730.8	3008.9	10440.3	1167.689	0.3880748	977901.3
Total gain bought	266.9	194	0	236	1226.5	266.002	1.1267869	76723
Total gain by remittance	2.6	0	0	1.5	251.2	19.33223	12.730003	493.5
Total through Aid	174.8	126.4		154.3	1267	207.6352	1.3456518	50147.7
Subtotal Gain (1+2+3+4)	4018.6	2563.5	730.8	3400.8	13185.2	1256.328	0.3694194	1105265.8
Gift to others	11.5	6	0	9.1	391.7	48.81246	5.3136196	2985.5
Grain sold	144.4	135.3	0	140.5	1260	215.4372	1.53253	45687.2
Post-harvest loss	0	0	0	0	0	0		0
Reserve for seed	579.9	518.4	0	553.8	2266.8	325.345	0.5874207	180002.3
Subtotal loss (5+6+7+8)	735.9	659.8	0	703.6	3918.6	454.2906	0.6456515	228675
Net Grain Available (subtotal1-subtotal 2)	3282.8	1903.7	730.8	2697.2	9266.6	1074.641	0.398428	876590.7

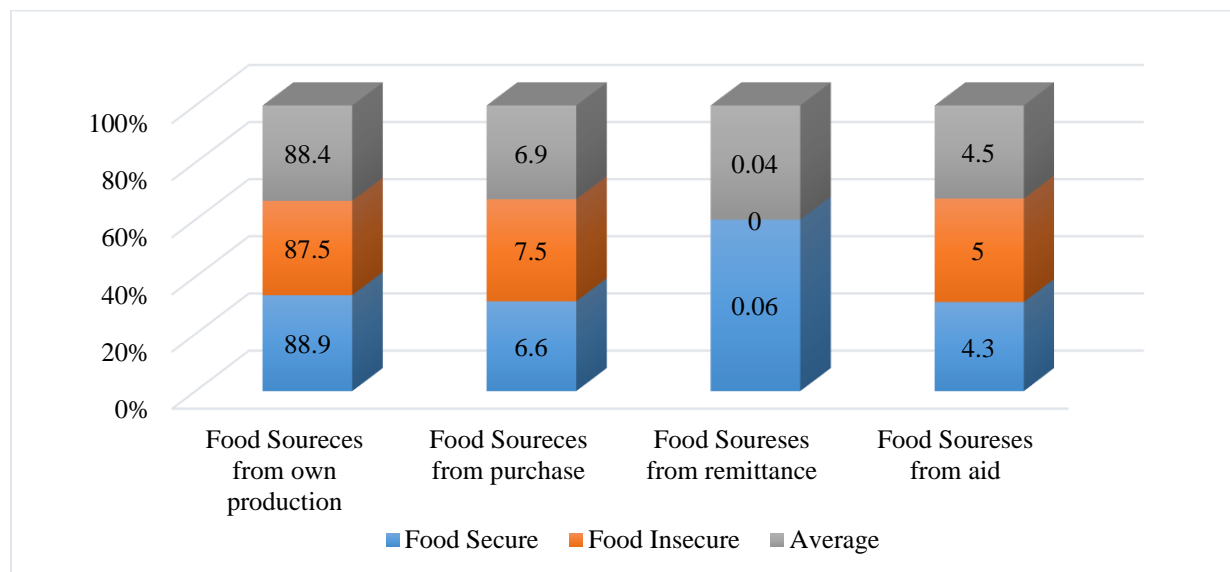
Sources: Field Survey, 2019

4.3.2.2. Main sources for food availability in the study area

Figure 4.9 shows the major food grain sources in terms of energy amount for the sample households. The survey data validated on average of 89%, 6% and 5% amount of calorie per capita was obtained from own production, domestic purchase and food aid sources in order of importance. It clearly depicts that domestic food grain production is one of the major sources of food supply followed by local purchase. On the other hand, it substantiates the fact that

variability in local agricultural production status largely affects the food availability situation of the area.

Figure 4.9: Food sources distribution of households



Sources: Field Survey, 2019

4.3.3. Household Food Insecurity Access Scale (HFIAS)

HFIAS is one of the indicators for food insecurity status based on the experience of household's access to food through measuring four week (one month) experience of household's food security statuses (Castell. et al, 2015). HFIAS computed calculations, measuring and scaling of responses to occurrence of nine questions, show Food security level of households including reduction of the number of meals consume to cut back on the quality of the food due to lack of resource. The food security status of the sampled households can be measured using the following HFIAS measurement tools, such as Household food insecurity access relate conditions and Household food insecurity access prevalence.

A. Household Food Insecurity Access Related Conditions

Household food insecurity access related to conditions indicated specific, disaggregated information about the behavior and perception of the surveyed households (Castell et al., 2015; Swindale, & Bilinsky, 2007). This measures the percent of household experiencing the condition at any level of severity. Each indicator can be further disaggregated to examine the frequency of experience of the condition across the surveyed households.

Table 4.10: Summary of household food insecurity access related conditions

Households level of severity in HFIAC (access), No (%)						
No		Yes	No	Rarely	Sometimes	Often
	Conditions			(Once-twice	(Three-ten	(More than
				per month)	per month)	per month)
1	Worry about food	245 (75.38)	68 (20.92)	126 (38.76)	107 (32.92)	92 (28.3)
2	Not able to eat preferred food	240 (73.84)	73 (22.46)	60 (18.46)	126 (38.76)	65 (20)
3	Eat a limited variety of foods	224 (68.92)	88 (27.07)	76 (23.38)	112 (34.46)	49(15.07)
4	Eat foods they really don't want	155 (47.69)	157 (48.3)	72 (22.15)	78 (24)	17 (5.23)
5	Eat a smaller meal than they felt	76 (23.38)	243 (74.76)	46 (14.15)	42 (12.92)	4 (1.23)
6	Eat fewer meal in a day	74 (22.76)	247 (76)	47 (14.46)	27 (8.3)	2 (0.61)
7	No food of any kind in the HH	54 (16.61)	269 (82.76)	43(13.23)	12 (3.69)	0
8	Go to sleep hungry	42 (12.92)	280 (86.15)	33 (10.15)	8(2.46)	0
9	Go whole day & night without eating	0	324 (99.69)	0	0	0

Sources; Field survey, 2019

Households food insecurity access relates condition result in the above table indicates that, from the entire sample households (75.38%) reported worried that they would not get (access) enough food while (20.92%) were not worried. The majority of the surveyed households were worried about not having enough food with frequency of (38.7%) rarely (once or twice in the past thirty days), (32.95%) were sometimes (three to ten times in the past thirty days) and (28.3%) often (more than ten times in the past thirty days (table 4.10).

In terms of the severity of household food insecurity access related condition across the surveyed households shows worry about food (75.38%), not able to eat preferred food (73.84%), and eat a limited variety of foods (68.92%) were the three most food insecurity conditions experienced by the households. On the other hand, only 12.92% household members reported go to bed at night hungry because of lack of resources to get enough food. Furthermore, household food insecurity experiences measure through HFIAS occurrence relate to three different domains of food insecurity (access) found that, anxiety and uncertainty about the household food supply (75.38%), insufficient quality (includes variety and preferences of the type of food) (68.

92%).and insufficient food intake and its physical consequences (23.38%) in decreasing order household food insecurity access related domains.

The household food insecurity access relate domain indicates almost the majority of the households were extremely worried about the lack of resources to get access of food and they would not have enough food, especially in context of quality and uncertainty about acquiring food more than half of the households were food insecure status and they are not able to eat preferred type of food due to a lack of resources. Moreover, still (22%)of households were reported eat fewer meal in a day, and (12.9%) of household's members reported go to sleep with hungry, therefore, food insecurity status of household's access-related domains was insightful that the many respondents had shortage of adequate food in previous one month. According to the key informants with rural farmers and experts, the severity of food insecurity was very severing in the summer season due to the pre harvest season of agricultural product and lack of sufficient product in their store for consumption.

B. Household Food Insecurity Access Prevalence(HFIAP)

Household food insecurity access prevalence is an important categorical indicator for food insecurity status of households into four levels of household food insecurity (access), food secure, and mild, moderately and severely food insecure(Coates et al., 2007). In the HFIAP households are categorized in different food insecure prevalence based on their affirmative responses to more severe food insecurity conditions and/or experience those conditions more frequently(Coates et al., 2007). Therefore, the HFIAP analyses in the following table according to Coates et al., (2007) household food insecurity access prevalence method.

In addition to household's food insecurity conditions the household food insecurity access scale (HFIAS) score is very useful measurement to understand the continuous degree of food insecurity (access) of the rural household in the past four weeks (30 days). According to the Coates et al., (2007) HFIAS measures score of the household is obtained by summing up to the code for each frequency of occurrence questions for the respective households. In this study, the average household food insecurity access scale (HFIAS) score was 6.62, the minimum and maximum score were 0 and 22 with median and standard deviation of 6 and 5.12 respectively.

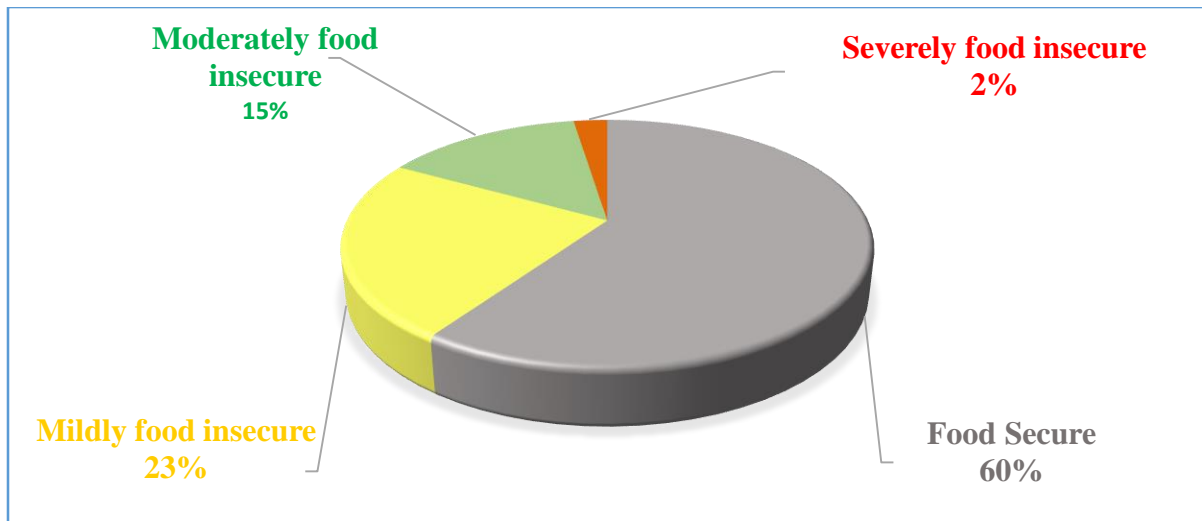
Table 4.11: Summary of Household Food Insecurity Access Prevalence(HFIAP)

No	Conditions	Households level of severity No (%)			
		Rarely	Sometimes	Often	Total
1	Worry about food	126 (38.76)	107 (32.92)	92 (28.3)	325
2	Not able to eat preferred food	60 (18.46)	126 (38.76)	65 (20)	251
3	Eat a limited variety of foods	76 (23.38)	112 (34.46)	49(15.07)	237
4	Eat foods they really don't want	72 (22.15)	78 (24)	17 (5.23)	167
5	Eat a smaller meal than they felt	46 (14.15)	42 (12.92)	4 (1.23)	92
6	Eat fewer meal in a day	47 (14.46)	27 (8.3)	2 (0.61)	76
7	No food of any kind in the HH	43(13.23)	12 (3.69)	0	55
8	Go to sleep hungry	33 (10.15)	8(2.46)	0	41
9	Go whole day & night without eating	0	0	0	0
			Food secure		Moderately food insecure
			Mildly food insecure		Severely food insecure

Analysis Based on the (Coates et al., 2007)

The household food insecurity access prevalence (HFIAP) scores in (figure 4.10) below shows that from the entire survey in Tsagibji district 60% of households were food secure, but some of households were worried about rarely, 23 % were mildly food insecure, 15% moderately food insecure, and only 2% were severely food insecure. This indicates that 60 % of sampled households in the district were food secure, whereas only 40 % were food insecure as indicated the figure, but still from food secure rural households in the district about 38.7 % of households were worried really about they would not get about enough food in the previous one month.

Figure 4.10: Households Food Insecurity Severity Level



Sources; Field survey, 2019

4.4. Econometric analysis

The econometric part of the study shows the determinants of seasonal migration in the study area, using binary logistic regression model. Then followed by the econometric result regarding to the determinants of seasonal migration in the study area was discussed.

4.4.1. Determinants of seasonal migration in the study area.

In this study, before going to perform the analysis of the determinants of seasonal migration in the study area, the important tests including an overall test of all parameters, a statistical significance test of each predictor, the goodness-of-fit statistics, inter correlations between the predictor variables and heteroskedasticity problems are tested.

In Logistic regression of the study the intercorrelations (multicollinearity) among the predictors can be assessed by a correlation matrix among the predictors, the result of multicollinearity diagnostics test found that there was no variable highly inter correlated with each other between both continuous and dummy explanatory variables of the dependent variable. This can be measured using Variance Inflation Factor (VIF) for association among continuous variables and contingency coefficients for dummy variables. Furthermore, goodness of model fit was tested the Hosmer and Lemeshow's goodness-of-fit test. The Hosmer and Lemeshow's goodness-of-fit test is that the predicted frequency and observed frequency should match closely, and that the more closely they match, the better the fit. Therefore, with a P-value of 0.9415 the Hosmer and Lemeshow's goodness-of-fit test indicates that our model fits the data well. Furthermore, heteroskedasticity was tested to check the variances of the error terms.

The Logistic regression model was used to identify determinants of food security. Therefore, variables assumed to have an influence on household migration status in different circumstances were tested in the model and out of seventeen (17) variables eleven (11) variables were found to be significant in the logistic regression result. The significant variables in model test are household's food security status, sex of household head, household size, land size, access to credit services, extension services, fertilizer, improved seed, PSP, tropical livestock unit, and educational level of household's head were found to be significant in determining household seasonal migration. The logistic regression was computed using STATA 13 with 325 number of

observation. As chi2 revealed, the overall significance of the model is useful based on the probability of less than one percent.

Table 4.12: Logistic regression estimation for the factors affecting seasonal migration

Migration status	B (Coef.)	(Std. Err.)	P>z	EXP(β) (Odds Ratio)
Food security status	-2.459828***	.0541298	0.000	.0854497
Sex of the household head	-1.753319***	.105959	0.004	.1731981
Age HH head	-.0482374	.0372982	0.218	.9529076
Household size	.6720579**	.5872405	0.025	1.958263
Land size	-1.785591***	.0689323	0.000	.167698
Credit service	-2.757862***	.0375422	0.000	.0634273
Fertilizer application	-2.17773***	.0776325	0.001	.1132985
Extension service	-2.459331***	.0560771	0.000	.0854921
Improved seed	-1.508664**	.1472671	0.023	.2212054
Distance from market	-.598708	.2246802	0.143	.5495212
Productive safety net program	1.441274**	2.532235	0.016	4.226078
Total income	.0000908	.0001354	0.502	1.000091
Tropical livestock unit	-.6918837***	.0936593	0.000	.5006322
Dependency ratio	-.46097	.19009	0.126	.6306716
Educational status	-1.378808**	.1632865	0.033	.2518787
Oxen	.5800256	1.465399	0.480	1.786084
Land fertility	.1702601	.670805	0.763	1.185613
_cons	12.95475	1215364	0.000	422841.9
Number of obs= 324; Log likelihood =-55.968201; LR chi2(20 =336.62;				
Prob > chi2 = 0.0000; Pseudo R2 = 0.7505				

Note: *** and ** significant at 1% and 5% significant level.

Source: Field survey result, 2019

Sex of household head: Among migrant household heads the proportion of male headed migrant households were greater than the female headed household. As hypothesized in this study female household head found to reduce the likelihood for seasonal migration. The logistic regression analysis result revealed that male headed household members are more seasonally migrants than their female counterparts at 1% significant level(table4.14). As expected, being a female household head is found to reduce the likelihood of seasonal out migration, being female headed household have 0.173 time less probability to seasonal out migration compared to male headed households, other things remain constant. The main reasons are customary practice of the society, regarding to categorizing female for unproductive work and male for productive works and domestic responsibility of females in most of rural parts in Ethiopia. This result is similar with research findings with Gibson & Gurmu, (2012) and Woldegebriel, 2017). In contrast to this, the finding is different with the finding of Beyene & Berhe, (2011) and Wondimagegnhu & Zeleke,(2017)show female head households are more migratory than male head households.

Household Size (HHS): The hypothesis of this variable based on the literature has a positive influence on the migration status of migrants which means that having the larger household size is expected increase the likelihood of seasonal out migration. as expected the logistic regression result was that there is a positive relationship between the odd of household's size and seasonal out migration at 5% significance level(table4.14). It means that change in increment of additional one household member increases the probability seasonal out migration by factor of 1.958, with other things remain constant. This result is consistent with studies conducted by (Tegegne & Penker, 2016b; B. Wondimagegnhu & Zeleke, 2017) which found a positive relationship between land size and seasonal out migration.

Educational status(EDU): this variable is one of determinant socio-economic factor for seasonal migration. In this study being educated is hypothesized negatively with seasonal migration. As expected the result shows this variable is negatively associated with seasonal out migration at 5% significance level (table 4.12). The odd of being migrated for literate household (can able to read and write) is 0.251 as compared to households which can't read and write(illiterate), keep other things constant. The probability migration for households which can read and write is 0 .251 lower than household which can't read and write(illiterate)(table4.14).

This finding is different with the results of with Tegegne & Penker, (2016) households completed secondary education were more positively significant relationship with more likely to migration decision compared with households which had lower education status. Additionally, other finding by Fassil & Mohammed, (2017) and (Woldegebriel, 2017) household who are educated is more likely to migrate toward urban areas due to its information access, income earning opportunities, and availability of jobs (Fassil & Mohammed, 2017).

Land size: As Land is a basic asset of rural population in Ethiopia, it is hypothesized that the increase in the land the size of land holding households was expected less likelihood to seasonal out migration. The result from logistic regression shows that land size has a negative relationship with seasonal migration at 1% significant level (table 4.14), that is increasing with additional unit of farm land to reduce the likelihood of seasonal out-migration by factor of 0.167, keeping other variables constant. This mainly due to the fact that agricultural yield depends on the size of the farm land rather than **uses** advanced technology, such as plant breeding techniques in small plot of land. Therefore, rural farmers with larger farm land size has achieved higher return rate than farmers with a smaller farm in the study area. The result is similar with the finding of (Wondimagegnhu & Zeleke, 2017) who found a negative and significant effect on seasonal migration.

Food security: In this study it was hypothesized as food secured households has less chance of being seasonally migrated at household level. As hypothesized this variable has a negative association with seasonal migration at 1% significant level (table 4.14). As compared to food in-secured, the food secured sampled household were more likely to be non-migrates. That means the odd of being migrant for food secured sampled households was 0.085 times lower than those who were food in-secured, other things remain constant, on other hand, being food secure households which have ability feed their households have 0.085 less chance to seasonal out migration compared to households, which that can't able get sufficient food for their household. This is due to the fact that majority of migrant households are more vulnerable in food insecurity problem as we can have understood from chi-square test result. This finding is consistent with studies by Tegegne & Penker, (2016) can found a positive and significant effect on migration.

Tropical Livestock Unit(TLU): it is an indicator of wealth and asset in most of rural part in Ethiopia, it is expected that household with lager TLU are less probability to being seasonally migrated. The result also indicates TLU negatively associated with seasonal migration at 1% significant level (table 4.14). The logistic analysis result in (Table 4.12) indicated that a unit increase in TLU reduce the likelihood seasonal migration by a factor of 0.500, other things remain constant. Households have had the large size of livestock has a probability to economically wealthy and food secure in most of rural areas in Ethiopia, due to this reason household who have large TLU less chance to seasonal migration in the study area. this result is similar in line with (B. Wondimagegnhu & Zeleke, 2017).

Access and use of credit services: The logistic regression measures the relation between households who has access and user of credit services and who has no access and non-user of credit service and migration status of households. The study expected households who access and utilize a credit services less chance to seasonal migration. The results suggest that becoming a user of credit services can reduce the household's migration status at 1% significant level with odd ratio of 0.0634 (table 4.14). As compared to households which have not access to credit services, the likelihood being migrated for households that have access and utilize a credit services from Amhara credit and service institution and other cooperatives was 0.0634 times lower than those households who have no access to credit service, other things remain constant. In contrast to this study, according to Wondimagegnhu & Zeleke, (2017) access to credit is not statistically significant with migration as a determinant factor of migration.

Access and use of extension Services: Migration literature showed that access to extension services have both positive and negative relations with seasonal migration in Ethiopian. In this study households who have access and utilize extension services were expected less probability to seasonal migration. The result of logistic regression disclosed that access to extension services negatively associated with migration status of households as expected at 1% significant level (table 4.14). This indicates the probability to being migrated for households which have access extension servicers was 0.085 times lower than households those who have no access to extension services. This is mostly because of the fact households who have and use extension services are more productive as well as less probability to seasonal out migration.

Productive Safety Net Program: The study area is one of the drought prone and agriculturally less productive area in Ethiopia, and particularly in Amhara region. Annually a substantial number of households were food insecure, live in extreme poverty situation and dependent on the relief assistance aid by different programs. The model measures the relation between the participants in PSP and non- participants of PSP and migration status of households. In this study participation in PSP was expected less likely to seasonal migration status of households. The logistic regression indicates that households benefit has a positive relation between seasonal migration at 5% significant level (table 4.14). The odd of being migrated for sampled households which have a relief assistance is 4.226 other thing remain constant. This means the likelihood of seasonal migration for households who are poor and dependent of PSP is 4.226 times more than household who are not benefited or dependent on PSP food aid Program. This because of the main target area of productive safety net program or other food aid programs are more focuses on the households who are economically very poor and for households who have no any asset. nevertheless, the relief aid is not only sufficient for households to stay in their home and most of households are not able escape from annually dependent on the relief assistance over a time.

As the result the volume of migration increased in household as they are poor, and dependent on the relief assistance. The result is consistent with, result of research findings from Amhara region by Wondimagegnhu & Zeleke, (2017) demonstrated that the poorest part of the society supported by relief assistance and those households more migratory than households in counterpart.

Utilization of fertilizer: Utilization of fertilizer is another institutional factor, that influence the livelihood and migration decision of household in the study area. The model measures the relation between the users of fertilizer and non-user with migration status of households. In the study households who use a land fertilizer were predicted less chance to seasonal migration. As expected the model result reveled utilization of fertilizer negatively associated with migration at 1% significant level (table 4.14). Those households which utilize fertilizer were less likely to be migrated compared to non-utilized sampled household in the study. The odd of being migrating for households which utilize fertilizer is reduced in 0.11 compared to households which cannot utilize fertilizer (keep other variables constant).

Access and use of improved seed: This is one of institutional factor that determine migration status of households. This study hypothesized that having access and utilization improved seed was expected to negatively associated with migration status of households. The result showed this variable is negatively associated with migration statues of household as expected at 5% significance level. The odd ratio of being migrations is 0.221(keep other things remain constant). Logistic regression result disclosed that the likelihood of being seasonal migrates for household's who have access and use of improved seed is 0.221 times less than from counterparts. This is mostly because of the fact that households who have access and use of drought resistant (improved) seed have relatively better productivity in the study area and less likelihood to seasonal out migration.

CHAPTER FIVE: CONCLUSION AND RCOMNNDATIONS

5.1. Conclusion

Internal migration in general and particularly seasonal migration as a multi-locational coping as well as adaptive livelihood strategy at household level is a key policy and research issue for development practitioners. This section first presents a general summary of the major findings of the study then draws conclusion and possible recommendations.

The major findings of the study on the determinants of seasonal migration differ depending on the livelihood strategy as well as socio-economic factors of the household. People consider economic factors attributing for seasonal migration in the district. However, the study revealed that seasonal migration is the result of multiple effects of different demographic, socio-economic, institutional and environmental factors and even if it is difficult to focus on a single attributing factor due to complexity as well as interrelated and multiple causality between the causes of seasonal migration in the study area. The result of the study shows that environmental induced factors especially, low, erosive and erratic rainfall distribution, floods, land degradation, frequent droughts, and natural disasters factors adversely affect subsistence agricultural production in the area and the overall economic capacity of the households for the last two and three decades, as a result the people are engaged in adaptive seasonal migration as coping as well as adaptive livelihood strategy. In addition to this, economic factors such as extreme poverty, frequent food insecurity, unemployment, landlessness, indebtedness and extravagant recourse utilization for social festivity play an important role in shaping the migration decision of households in the district.

In addition to abovementioned environmental induced and economic factors, migration patterns in the district are driven pushes resulted from poverty, unemployment, natural disasters as the same time pull factors resulted urbanization and industrialization in urban centers attribute for seasonal migration.

From the livelihood point of view, seasonal migration becomes an important livelihood strategy, either as choices and necessity driven diversification livelihood strategy. The former is a voluntary and main reason to improve economic wellbeing. On the other hand, necessity-driven an action to escape from livelihood deficit. In accordance with this, all evidence from the study area suggests rural households migrated as necessity to escape from a situation of food insecurity, structural poverty, and other environmental and economic shocks, besides to this the study confirmed more than half of migrant households were found food insecure in the district.

The result indicated households who are illiterate, male-headed, economic poor and dependent on food aid programs, anxious about food security, marginalization from access to infrastructural development, limited access to agricultural inputs and institutional facilities are mainly vulnerable to temporarily migration. The study also indicated the stream of seasonal migration changed over time, previously people migrated to agriculturally productive and commercialized agricultural rural areas. whereas recently migration movement shifted towards rural-urban area due to the development of the construction and service sector in the urban areas, namely Bahir Dar, Dessie, Kobo and Mekelle. However, one insight from this result that may require a detail investigation about the seasonal migration in the context of urban unemployment and absorption capacity of the urban centers in Ethiopia as it has implications for designing policies to address rural and urban unemployment. Furthermore, seasonal migration relatively more concentrated only in the nearest areas and short-distance areas.

The migration decision of households is mainly a collective decision of household's member's. Seasonal migration can have a positive effect on both migrant household members and entire households, especially in reducing risks and smoothing food security, covering basic expenditure of their households, other agricultural inputs, pay debts loans and buy livestock. Moreover, migration coping to reduce poverty it has improved the availability and access of food, However, the migrant household is in a vicious circle of poverty.

The study revealed that circular migration has contributed to migrant household numbers from lagging rural area to prosperity urban area through wage rates or employment differentials between rural and urban area. to this end, to improve the agricultural productivity and food

security of the household will help to reduce the drawbacks seasonal migration in the agricultural productivity and migrant household members.

5.2. Recommendations

Based on the findings of the study the following issues are forwarded as a recommendation to reduce number seasonal migration as well as improve the livelihood of households Tsagibii district.

- ☞ Improving the income per capita of household members: Income diversification can be emphasized by encouraging both off-farm and non-farm employment opportunities, through which some members of the households could shift from direct reliance on the land for their livelihoods. Also, diversifying farm activities, besides annual crop production where potential exists such as focusing on perennial crops, vegetables, and fruit through small scale irrigation should be encouraged.

- ☞ Agricultural Development Office is recommended to work on in the strengthening the livestock sector of the area through giving emphasis to encouragement of households to diversify their livelihood including livestock, provision of veterinary services, prevention of animal diseases and the development of marketing facilities for animal and animal products will help the livelihood of the rural households.: Livestock was found as an important source of wealth that could contribute to food security of as well as it influences the migration decision of households in the study area.

- ☞ Environmental Protection Office and other relevant stakeholders (District Agricultural development Office and District Administration Office) is recommended to worked on environmental rehabilitation and protection activities environmental problems in a sustainable manner, in this respect, soil and water conservation activities such as gully treatments and afforestation/reforestation activities are highly recommended. Promoting environmental awareness among the people of the study area will importantly contribute to environmental conservation.

☞ District Administration Office is recommended to work on improving infrastructural development and other institutional facilities such education, road, health centers, and credit institutions can help the rural households to diversify livelihood strategy in short term and reduce the dependency on subsistence agriculture.

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Appendix

Appendix 1: Food Composition Table for Use in Ethiopia –Part III:

Annex 2 Food Composition Table for Use in Ethiopia –Part III:

No	Food and Description	Local name	Food energy
1	Tef, Eragrostis tef (Zucc.)Trott.	T'yef,dibilliq	358.90
2	(maize) , Zea mays L. :white, whole grain	Beqqollo, nech	375.00
3	Sorghum, Sorghum spp.: white, whole grain	Mashyilla, nech	359.20
4	Barley, White the wole grain	Gbis nech	372.30
5	Wheat, Triticum vulgare vill.: white ,whole grain	Sindy, nech	362.30
6	Broad beans, Vicia faba L. :,whole, dried	Baqyela,difin	351.40
7	Chickpeas,Cicer arietinum L.: whole, dried	Shimbera, difin	372.30

Source: Ethiopian Health and Nutrition Research Institute (EHRI)

Appendix 2: Adult Equivalent Conversion Factor

Annex 3 Adult Equivalent Conversion Factor

Age Category	Adult equivalent Ratio
Male less than 10	0.6
Male 10 to 13	0.9
Male 14 to 16	1
Male 17 to 50	1
Male greater than 50	1
Female less than 10	0.6
Female 10 to 13	0.8
Female 14 to 16	0.75
Female Male 17 to 50	0.75
Female greater than 50	0.75

Source: Institute Pan African Pour le Development (1981); as indicated (Getnet Kebede, 2015)

Appendix 3: Conversion factors of tropical livestock unit (TLU)

Annex 3 Total livestock unit conversion factor

Livestock	Average Biomass (Kg)	TLU Equivalent
Camels	250	1
Cattle	175	0.7
Sheep/Goat	25	0.1
Horses/Mules	200	0.8
Donkeys	125	0.5

Appendix 4: Multi-collinearity problem detection, VIF test for continuous variables

Annex 4: VIF test for continuous variables

Variable	VIF	1/VIF
Age	1.74	0.573181
Household size	1.59	0.628397
Land size	1.50	0.666190
Tropical livestock unit	1.31	0.763772
Total income	1.08	0.925282
Dependency ratio	1.07	0.932285
Distance from market	1.02	0.982209
Mean VIF	1.33	

Source: Model output

Appendix 5: Multi-collinearity problem detection, Contingency coefficient for dummy variables

	Migstat	Fss	Sex	Credit	Fertilizer	Extenser	Impseed	PSP	Edu	Oxen	Landfert
Migstat	1										
Fss	-0.31	1									
Sex	-0.15	0.05	1								
Credit	-0.50	0.11	0.10	1							
Fertilizer	-0.50	0.10	-0.02	0.14	1						
Extenser	-0.52	0.11	0.08	0.31	0.39	1					
Impseed	-0.28	0.10	-0.06	0.08	0.25	0.13	1				
PSP	0.2	-0.02	0.06	-0.10	-0.20	-0.07	-0.11	1			
Edu	-0.18	0.07	0.02	0.00	0.03	0.14	0.00	0.06	1		
oxen	-0.48	0.15	0.05	0.30	0.36	0.31	0.19	-0.13	0.06	1	
Landfert	-0.03	-0.06	-0.08	0.05	0.11	-0.04	0.10	-0.00	0.13	0.0104	1

Source: Model output

Appendix 6: Model goodness fit test Result

. estat gof, all group (10)

Logistic model for migstat, goodness-of-fit test

(Table collapsed on quantiles of estimated probabilities)

number of observations = 324

number of groups = 10

Hosmer-Lemeshow chi2(8) = 2.64

Prob > chi2 = 0.9549

Appendix 7: Heteroskedasticity test result

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of migstat

chi2(1) = 1.18

Prob > chi2 = 0.2781

Appendix 8: Dietary energy availability of sampled HHs in Kcal /person/day

HH Id	Production	Purchasing	Remittance	Food aid	Total Gain(A)	Gift	Sale	Post-harvest loss	Seed Reserved	Total loss(B)	Balance (A-B)
1.	2685.4	0	0	239.1	2924.6	0	0	0	0	0	2924.6
2.	1999	701.1858	0	0	2730.4	183.5	187.7	0	548.2	919.4	1811
3.	4964.1	581.688	0	0	5597.6	0	0	0	633.9	633.9	4963.7
4.	3102.6	1033.831	0	0	4136.6	0	352.1	0	680.8	1033	3103.6
5.	1984.9	1044.115	0	0	3058.7	0	180.2	0	546.4	726.6	2332
6.	2017.9	0	0	245	2263	0	0	0	0	0	2263
7.	1519.9	196.557	0	187.2	1903.8	0	0	0	196.5	196.5	1707.3
8.	2096.4	676.7967	0	345.2	3147.6	0	0	0	701.8	701.8	2445.8
9.	1943.6	487.7992	0	0	2431.4	0	0	0	487.7	487.7	1943.6
10.	2261.1	680.4636	0	223	3164.6	220.8	0	0	680.4	901.2	2263.4
11.	1554.1	1032.808	0	0	2587	255.2	0	0	519.7	774.9	1812
12.	2522.3	812.0681	0	204.6	3539.2	0	214.7	0	832	1046.8	2492.4
13.	1233.8	1002.797	0	245	2481.7	0	0	0	0	0	2481.7
14.	2906.4	209.996	0	0	3116.4	0	214.7	0	624.3	839.1	2277.3
15.	1778.2	0	0	144.9	1923.3	0	152	0	437	589.1	1334.2
16.	2736	377.5602	0	0	3113.5	391.7	200.3	0	577.8	1169.9	1943.6
17.	3939.4	0	0	0	3939.4	0	496.4	0	496.4	992.8	2946.5
18.	2530.5	0	0	0	2530.6	0	396.1	0	585.1	981.3	1549.2
19.	3868	233.9559	0	0	4102.1	248	490.5	0	724.4	1463	2639.1
20.	3144.4	276.7929	0	279.6	3700.8	0	852.9	0	852.9	1705.9	1994.8
21.	3077.5	763.9907	0	756.2	4597.8	193.9	782	0	948.6	1924.6	2673.1
22.	2808	248.7632	251.2918	502.5	3810.7	251.2	257.8	0	1017.8	1527	2283.6
23.	3493.7	751.3203	0	0	4245	0	1260	0	984.6	2244.6	2000.4
24.	2129.4	426.1825	0	417.9	2973.5	0	206.8	0	426.1	633	2340.4
25.	2422.6	337.644	0	848.3	3608.7	0	679.7	0	689.8	1369.5	2239.1
26.	4700.9	836.2678	0	1267.1	6804.3	0	861.4	0	1283.8	2145.2	4659.1
27.	3194.5	0	0	393.1	3587.6	0	407.4	0	992.7	1400.1	2187.4
28.	6796.3	384.3323	0	1123.7	8304.4	384.3	727.3	0	2266.8	3378.5	4925.8
29.	3623.8	0	0	0	3624.3	245.4	236.7	0	732	1214.2	2410
30.	4764.3	253.5723	0	0	5018.5	0	1007.3	0	1007.3	2014.7	3003.8
31.	3640.2	0	0	0	3640.6	0	693.7	0	916.8	1610.5	2030.1
32.	3956.7	0	0	0	3957.2	0	251.4	0	1229.6	1481.1	2476
33.	2416.4	0	0	0	2416.6	0	274.5	0	669.6	944.1	1472.4
34.	3480.9	505.2299	0	0	4033.2	0	576.1	0	869.6	1445.8	2587.3
35.	2335.8	0	0	407.9	2336.1	0	268.9	0	557.5	826.4	1509.6
36.	3198	178.6808	0	417.9	3412.1	0	426.1	0	635.1	1061.3	2350.8
37.	2465.9	122.12	0	428.4	2612.4	0	578.9	0	428.6	1007.5	1458.2

38.	3250.9	0	0	0	3250.9	0	604	0	413.2	1017.3	2233.5
39.	1720.6	0	0	153.8	1720.7	0	317.1	0	317.1	634.2	1086.5
40.	4704.8	0	0	0	4704.8	0	595.4	0	873.2	1468.6	3236.1
41.	5356.7	0	0	786.2	5357.2	0	796.1	0	987.8	1784	3573.2
42.	4760.7	0	0	589.6	4761.1	0	992.9	0	583.3	1576.3	3184.7
43.	2738	0	0	223	2738.1	0	228.8	0	228.8	457.7	2280.4
44.	2956.3	196.8401	0	206.7	3153.2	0	217	0	633.9	850.9	2302.3
45.	2911.6	0	0	541.4	2912	0	368	0	548.5	916.6	1995.4
46.	2774.5	0	0	0	2774.5	0	0	0	433.7	433.7	2340.7
47.	2303.6	0	0	536.5	2304	0	0	0	134.1	134.1	2169.8
48.	4290	0	0	678.7	4290	0	352.1	0	505.2	857.4	3433
49.	2380.7	0	0	786.2	2381.2	0	399.9	0	587	986.9	1394.3
50.	3609.6	0	0	678.7	3610	0	691.5	0	511.1	1202.6	2407.3
51.	2440.5	0	0	200.5	2440.6	0	404.2	0	198.5	602.7	1837.9
52.	2952.1	0	0	0	2952.5	0	369.8	0	376.1	746	2206.5
53.	2278.7	177.127	0	0	2456	0	0	0	177.1	177.1	2278.9
54.	2542.5	355.895	0	0	2898.6	0	0	0	543.5	543.5	2355
55.	1845.7	156.789	0	0	2002.6	0	0	0	150	15	1852.6
56.	2566	175.0844	0	0	2741.3	0	0	0	175	175	2566.3
57.	1194.8	162.9021	0	0	1357.9	0	0	0	342.5	342.5	1015.3
58.	3988.4	0	0	245	4234	0	242.6	0	741.2	983.9	3250.1
59.	3157.6	0	0	0	3157.8	0	0	0	980.6	980.6	2177.1
60.	3342.1	0	0	0	3342.5	0	202.6	0	214.7	417.3	2925.1
61.	1731.2	0	0	0	1731.4	0	0	0	175.6	175.6	1555.8
62.	2483.5	0	0	0	2483.8	0	499.8	0	257.2	757	1726.8
63.	3706	0	0	204.6	3911	0	0	0	826	826	3085
64.	2199.4	0	0	213.4	2199.6	0	219	0	663.9	882.9	1316.6
65.	2363.9	185.0392	0	178.8	2549	0	177	0	0	177	2372
66.	2612.5	0	0	0	2612.5	0	0	0	484.1	484.1	2128.4
67.	4633.7	0	0	610.8	4634.1	0	320.5	0	622.8	943.4	3690.7
68.	3468	0	0	264.6	3733.2	0	0	0	264.6	264.6	3468.5
69.	2383.6	0	0	625.2	3008.9	0	0	0	631.4	631.4	2377.5
70.	2398.3	0	0	0	2398.5	0	0	0	298.2	298.2	2100.2
71.	3374.1	0	0	589	3964.1	0	0	0	0	0	3964.1
72.	4671	443.2988	0	0	5114.5	0	418.1	0	1263.4	1681.6	3432.9
73.	4003.6	416.7009	0	397	4817.6	0	790	0	1221.1	2011.2	2806.4
74.	2642.7	0	0	0	2642.7	0	0	0	615.1	615.1	2027.5
75.	2438	175.6001	0	0	2613.8	0	0	0	352.6	352.6	2261.2
76.	2400.3	206.2876	0	0	2606.9	0	0	0	206.2	206.2	2400.6
77.	3916.8	207.0082	0	0	4164.7	0	239.6	0	744.2	983.8	3180.8
78.	2279.6	129.5777	0	0	2434.9	0	151.5	0	295.7	447.3	1987.6

79.	2255.4	146.3334	0	0	2430.6	0	0	0	179.6	179.6	2251
80.	2225.2	168.0661	0	0	2426.3	0	0	0	604.2	604.2	1822.1
81.	1895.8	0	0	0	1896	0	0	0	0	0	1896
82.	4119.9	0	242.2647	0	4362.5	0	0	0	509.3	509.3	3853.1
83.	2365.3	0	0	257.8	2623.5	0	0	0	528.4	528.4	2095.1
84.	2408.5	676.6403	0	218.1	3303.6	0	0	0	663	663	2640.5
85.	2509.6	0	0	0	2509.8	0	0	0	153.5	153.5	2356.3
86.	3223.3	508.6994	0	490.1	4222.2	0	0	0	984.6	984.6	3237.6
87.	2500.3	0	0	328.1	2828.4	0	0	0	502.4	502.4	2325.9
88.	4082.9	0	0	200.5	4283.7	0	0	0	818.9	818.9	3464.7
89.	2395.7	183.51	0	357.6	2936.9	0	0	0	554.2	554.2	2382.7
90.	3333.1	255.3601	0	0	3588.5	0	0	0	549.7	549.7	3038.7
91.	1880.8	174.9689	0	367.6	2423.4	0	181.9	0	188.1	370	2053.3
92.	2805.7	186.8772	0	0	2992.5	0	0	0	366.6	366.6	2625.9
93.	3023.7	0	0	185.5	3209.5	0	0	0	185.5	185.5	3024
94.	2142.7	155.4932	0	0	2298.3	0	0	0	155	155	2143.3
95.	1605.3	0	0	0	1605.3	0	0	0	344.1	344.1	1261.1
96.	2860.2	205.7536	0	0	3066.1	0	0	0	614.7	614.7	2451.4
97.	2850.1	0	0	0	2850.3	0	173.9	0	540	713.9	2136.3
98.	1526.3	0	0	0	1526.6	0	168.2	0	334.7	503	1023.5
99.	3061.8	0	0	401	3463	0	406.2	0	1022.7	1428.9	2034
100.	2560.1	170.2401	0	178.8	2730.4	0	170.24	0	556.2	726.4	2003.9
101.	1332.6	138.9459	0	291.9	1471.7	0	294.2	0	149.7	444	1027.7
102.	4288.3	0	0	467.1	4288.6	0	0	0	476.3	476.3	3812.3
103.	2009.7	299.7424	0	151.5	2461.2	0	0	0	460.6	460.6	2000.5
104.	2381.4	182.5234	0	213.4	2600	0	0	0	638.5	638.5	1961.5
105.	1766.1	454.0674	0	251.2	2262.6	0	0	0	259.9	259.9	2002.6
106.	2932.9	491.3722	0	783.6	3468.8	0	0	0	274.1	274.1	3194.6
107.	3498.9	663.3781	0	456.3	4201	0	0	0	709.7	709.7	3491.3
108.	2067.5	145.0827	0	169.6	2411.1	0	0	0	337.6	337.6	2073.4
109.	1861.9	476.6181	0	0	2366.9	0	0	0	339.1	339.1	2027.7
110.	2328.2	178.6808	0	0	2542.1	0	219.3	0	426.1	645.4	1896.6
111.	1750.7	0	0	0	1750.9	0	0	0	155.9	155.9	1594.9
112.	4317.7	0	0	0	4318.2	0	257.8	0	770.3	1028.1	3290
113.	3150	0	0	220.5	3370.7	0	457.8	0	888.3	1346.2	2024.5
114.	1814.9	0	0	162.7	1977.7	0	0	0	494.5	494.5	1483.1
115.	1777.3	347.489	0	0	2125	0	347.8	0	360	707.8	1417.1
116.	2496.4	0	0	0	2496.6	0	0	0	626.8	626.8	1869.7
117.	2853.2	0	0	0	2853.4	0	0	0	959.5	959.5	1893.9
118.	1953.7	302.3463	0	158.8	2415	0	321.7	0	484.2	806	1608.9
119.	4595.9	0	0	0	4596.4	0	0	0	498.4	498.4	4097.9

120.	2786.9	151.1715	0	0	2938.4	0	156.6	0	624.3	781	2157.3
121.	2485.9	0	0	0	2486	0	0	0	494	494	1991.9
122.	3825.9	281.5547	0	0	4107.7	0	0	0	547.1	547.1	3560.5
123.	2069.3	385.0902	0	185.5	2640	0	0	0	754.2	754.2	1885.7
124.	3770.3	277.8006	0	264.6	4048.3	0	0	0	277.8	277.8	3770.5
125.	730.8	872.4351	0	144.9	1603.4	0	0	0	431.3	431.3	1172
126.	2464.4	0	0	172.6	2464.6	0	0	0	359.7	359.7	2104.8
127.	2031.4	444.2015	0	285.6	2475.8	0	0	0	296.4	296.4	2179.3
128.	2015	155.4932	0	151.5	2322.1	0	0	0	457	457	1865.1
129.	3017.7	0	0	268.2	3286.2	0	0	0	815.3	815.3	2470.8
130.	2376.4	306.7676	0	0	2683.3	0	0	0	482.3	482.3	2201
131.	1882.3	336.7092	0	0	2219.3	0	0	0	517.1	517.1	1702.1
132.	2825.2	182.7635	0	0	3008.2	0	178.6	0	533.8	712.5	2295.7
133.	2969	0	0	0	2969.4	0	0	0	703.2	703.2	2266.1
134.	2034.6	125.9776	0	0	2160.7	0	0	0	138.9	138.9	2021.8
135.	3633.1	217.624	0	0	3893.8	0	0	0	0	0	3893.8
136.	2229.2	454.4401	0	0	2710.1	160.3	0	0	324.4	484.8	2225.3
137.	2496.3	280.5731	0	0	2832.4	0	168.3	0	659.1	827.4	2005
138.	2278.8	0	0	0	2279	0	0	0	384.6	384.6	1894.4
139.	2392.8	0	0	0	2393	0	0	0	376.1	376.1	2016.8
140.	3586.4	201.6793	0	0	3788.3	0	374.1	0	393.3	767.5	3020.7
141.	3957.8	0	0	456.3	3958.1	0	0	0	225.8	225.8	3732.2
142.	2114.7	164.3187	0	172.6	2279.1	0	181.1	0	530.6	711.8	1567.3
143.	4216.8	178.2702	0	561.8	4395.5	0	0	0	767.6	767.6	3627.8
144.	2952.8	196.8401	0	620.3	3150.1	0	0	0	1054.1	1054.1	2096
145.	2864.7	178.2702	0	374.5	3043.2	0	0	0	762.9	762.9	2280.2
146.	2513.5	409.6051	0	409.3	2923.4	0	209.9	0	634.2	844.2	2079.2
147.	2381	0	0	333.6	2381.2	0	0	0	340.2	340.2	2041
148.	2840.4	203.6961	0	198.5	3242.8	205.3	0	0	804.1	1009.5	2233.2
149.	2030.9	134.976	0	0	2166.1	0	0	0	294.3	294.3	1871.7
150.	2688.7	178.2702	0	0	2867.1	0	193.7	0	581.9	775.7	2091.3
151.	2040.6	324.0708	0	0	2384.6	0	0	0	240.7	240.7	2143.8
152.	2214.9	158.7953	0	0	2373.8	0	0	0	510.9	510.9	1862.9
153.	4750.2	444.8202	0	233.5	5468.4	0	231.2	0	948.8	1180	4288.3
154.	5111.7	986.0903	0	0	6154.7	0	0	0	1375.7	1375.7	4778.9
155.	4095.5	0	0	287.7	4095.7	0	0	0	0	0	4095.7
156.	2105.5	362.3486	0	345.2	2468.1	0	0	0	352	352	2116
157.	5142.7	0	0	672.9	5143.2	0	333	0	353.1	686.2	4457
158.	2436.7	147.6059	0	172.6	2786.2	0	0	0	875.8	875.8	1910.3
159.	7650.6	320.2769	0	374.5	8409	0	0	0	1906.1	1906.1	6502.9
160.	2285.8	282.9112	0	300.7	2594.2	0	0	0	614.9	614.9	1979.2

161.	4261	286.8959	0	559.2	4548.3	0	0	0	852.9	852.9	3695.4
162.	1662.2	157.8412	0	300.7	1820.2	0	0	0	157.8	157.8	1662.4
163.	2935.1	1179.453	0	239.1	4354.1	245.4	0	0	735.6	981	3373
164.	2877	205.3983	0	0	3082.6	0	221.4	0	884.7	1106.1	1976.4
165.	1341.2	277.8919	0	0	1619.2	0	0	0	283.4	283.4	1335.7
166.	2735.2	887.6174	0	223	3622.9	0	0	0	462.9	462.9	3160
167.	2286	142.08	0	149.2	2428.2	0	0	0	304.4	304.4	2123.8
168.	2168	0	0	285.6	2168.2	0	0	0	141.3	141.3	2026.8
169.	2560	0	0	281.5	2560.7	0	0	0	432.8	432.8	2127.9
170.	2692.8	0	0	189	2693	0	0	0	392.4	392.4	2300.6
171.	3886.5	0	0	401	3886.8	0	0	0	0	595.5	3886.8
172.	2689.4	193.9963	0	378.1	2883.7	0	198.4	0	588	786	2097.2
173.	2194.2	0	0	196.5	2390.9	0	402.8	0	402.8	805.6	1585.2
174.	5134.5	973.9324	0	336.4	6502	0	0	0	1342.9	1342.9	5159
175.	2265.2	171.4614	0	200.5	2671	0	0	0	613.7	613.7	2057.3
176.	5123.7	287.7064	0	0	5468.5	0	0	0	698.3	698.3	4770.1
177.	2385.4	288.4013	0	0	2700.4	0	160.3	0	479.1	639.5	2060.8
178.	2053	346.7275	0	0	2399.8	0	0	0	173.3	173.3	2226.5
179.	2414.4	194.5772	0	0	2609.1	0	0	0	604.2	604.2	2004.8
180.	2129.3	304.7846	0	160	2594.4	0	168	0	492.3	660.4	1934
181.	2528.9	322.9058	0	0	2851.9	0	163.7	0	669.6	833.4	2018.5
182.	6482.4	1226.497	0	0	7709.4	0	0	0	1699.9	1699.9	6009.5
183.	2707.1	314.9441	0	0	3022.1	0	169.7	0	676.4	846.1	2176
184.	2119.3	0	0	0	2119.4	0	0	0	198.4	198.4	1921
185.	3496.5	377.9287	0	0	3874.7	0	0	0	565.9	565.9	3308.7
186.	3672.1	179.6125	0	0	3852	0	0	0	179.6	179.6	3672.4
187.	2107.4	426.8384	0	0	2559.3	0	146.6	0	600	746.7	1812.6
188.	1877	468.2637	0	0	2373.5	0	0	0	331.9	331.9	2041.5
189.	1857.5	515.9718	0	182.1	2586.5	0	186.8	0	748.5	935.4	1651
190.	3492.7	553.2118	0	0	4079.9	0	0	0	408.9	408.9	3670.9
191.	4060.5	604.0962	0	0	4665	0	0	0	628.5	628.5	4036.5
192.	2782.5	198.9121	0	0	2981.5	0	216.2	0	856.2	1072.4	1909.1
193.	3339.2	209.996	0	0	3549.5	0	0	0	424.2	424.2	3125.3
194.	4064.5	775.5054	0	0	4840.4	0	0	0	1346.9	1346.9	3493.4
195.	2712.4	0	0	0	2712.7	0	172.5	0	510.1	682.7	2030
196.	6639.4	343.5754	0	0	6983.7	0	0	0	1109.1	1109.1	5874.6
197.	2292	348.0165	0	0	2640.1	0	0	0	713.5	713.5	1926.6
198.	4314.3	631.9498	0	0	4946.7	0	0	0	333	333	4613.6
199.	4321.9	277.8006	0	0	4600	0	0	0	549.3	549.3	4050.7
200.	3906.2	224.0327	0	0	4130.7	0	219	0	443	662	3468.6
201.	2020.2	200.5258	0	0	2221	0	0	0	200.5	200.5	2020.6

202.	4637.3	500.055	0	0	5137	0	0	0	1023.7	1023.7	4113.9
203.	3888.4	408.963	0	200.5	4498.1	0	0	0	800.3	800.3	3697.8
204.	5125	908.3126	0	592.5	6626	0	282	0	897	1179	5446.9
205.	2245.7	0	0	218.1	2463.9	0	223.8	0	449.5	673.3	1790.5
206.	3462.5	580.4244	0	0	4077	0	0	0	415.6	415.6	3661.4
207.	3664.1	204.5142	0	0	3909	0	0	0	495.7	495.7	3413.3
208.	2605.2	317.4718	0	0	2951.7	0	175.6	0	686.2	861.8	2089.8
209.	2805	196.555	0	0	3001.7	0	201.1	0	791	992.2	2009.5
210.	2447.3	482.1916	0	239.1	3169	0	0	0	1219.8	1219.8	1949.2
211.	3619.3	0	0	0	3619.8	0	173.6	0	335.1	508.7	3111
212.	2880.3	0	0	0	2880.3	0	0	0	782.7	782.7	2097.6
213.	3665.5	612.0331	0	0	4277.9	0	205.2	0	616.1	821.3	3456.5
214.	2458.2	0	0	0	2458.3	0	170.8	0	352	522.9	1935.4
215.	3940.5	264.5404	0	257.8	4463.2	0	0	0	257.8	257.8	4205.4
216.	2126.4	147.6059	0	172.6	2475.8	0	0	0	532.4	532.4	1943.4
217.	1609.8	681.9415	0	0	2316	0	0	0	291.2	291.2	2024.7
218.	2181.6	141.4556	0	165.4	2516.4	0	171.1	0	506.3	677.5	1838.9
219.	4110.2	403.0486	0	0	4551.1	0	449.6	0	683.7	1133.4	3417.6
220.	1874.1	298.9277	0	0	2200.9	0	0	0	173.6	173.6	2027.3
221.	2251.7	468.1023	0	0	2748.6	0	175.5	0	511.1	686.7	2061.9
222.	1483.6	986.7553	0	204.6	2709.6	0	0	0	614.2	614.2	2095.4
223.	2170.9	0	0	0	2171.1	0	0	0	160.2	160.2	2010.8
224.	2293.3	202.601	0	204.6	2700.8	0	0	0	626.4	626.4	2074.4
225.	3733.5	190.1792	0	551.4	3924	0	0	0	0		3924
226.	2304.2	0	0	161.3	2304.3	0	331.2	0	334.9	666.2	1638.1
227.	2866.7	0	0	200.5	2866.9	0	0	0	210.4	210.4	2656.4
228.	2458.9	341.779	0	172.6	2800.8	0	178.6	0	526.1	704.7	2096
229.	2260	396.6288	0	200.5	2857.4	0	0	0	821.9	821.9	2035.5
230.	2878.8	190.8752	0	0	3069.8	0	413.2	0	623.6	1036.8	2032.9
231.	5007.9	1083.879	0	374.5	6466.9	0	384.3	0	758.8	1143.2	5323.7
232.	2308.2	600.0127	0	0	2908.4	0	211.7	0	629.1	840.8	2067.6
233.	3976.5	490.822	0	257.8	4725.5	0	263.8	0	528.4	792.2	3933.3
234.	4330.3	775.5054	0	264.6	5106	0	270.8	0	529.7	800.6	4305.3
235.	1965.6	422.2178	0	213.4	2387.9	0	220.8	0	220.8	441.7	1946.2
236.	2791.7	0	0	213.4	2791.9	0	203.1	0	646.2	849.4	1942.4
237.	2140.2	173.9141	0	351.3	2314.4	0	0	0	358.2	358.2	1956.1
238.	2239.6	0	0	245	2239.7	0	0	0	253.5	253.5	1986.2
239.	5218.6	0	0	257.8	5476.87	0	1000.7	0	792.9	1793.7	3683.1
240.	2294.6	170.8895	0	0	2465.6	0	176.6	0	181.1	357.8	2107.7
241.	1916.3	214.4169	0	0	2130.9	0	213.8	0	214.4	428.2	1702.6
242.	3405.6	173.9141	0	0	3579.6	0	0	0	366.1	366.14	3213.5

243.	3031.6	0	0	213.4	3245.2	0	220.8	0	1071	1291.8	1953.3
244.	1805.1	492.368	0	0	2297.7	0	0	0	501.9	501.9	1795.7
245.	4160.6	0	0	0	4160.7	0	0	0	0	0	4160.7
246.	2116.6	264.5404	0	0	2381.3	0	0	0	535.1	535	1846.1
247.	6136.4	333.0897	0	336.4	6806.5	0	0	0	1703.2	1703	5103.2
248.	4253.2	297.8013	0	348.2	4958.1	0	360.3	0	1410.7	1771	3187
249.	3257.7	345.5374	0	0	3635	0	0	0	196.5	196.5	3438.4
250.	2265.9	158.6418	0	185.5	2641.5	0	190.3	0	570.6	760.9	1880.5
251.	4941.4	261.1488	0	0	5254.3	0	0	0	290.7	290.7	4963.6
252.	2708.6	412.5969	0	204.6	3326.2	0	0	0	1043.7	1043.7	2282.4
253.	1990.5	157.8412	0	150.3	2298.8	0	0	0	308.2	308.2	1990.6
254.	1700.2	309.0636	0	0	2009.3	0	0	0	309	309	1700.3
255.	7170.1	0	0	0	7170.5	0	665.5	0	665.5	1331	5839.5
256.	10440.3	0	0	0	10440.8	0	0	0	1532.3	1532.3	8908.4
257.	3556.7	245.6537	0	248.1	4050.7	0	254.6	0	1519.5	1774.1	2276.5
258.	4942.3	0	0	348.2	5290.8	0	713.7	0	705.6	1419.4	3871.4
259.	3094	167.9683	0	169.6	3431.8	0	335.1	0	684.8	1019.9	2411.9
260.	2324.7	193.9963	0	0	2518.8	0	193.4	0	394	587.5	1931.3
261.	3906.2	211.315	0	0	4117.7	0	439.2	0	439.8	879.1	3238.5
262.	2131.2	0	0	0	2131.4	0	0	0	356.9	356.9	1774.5
263.	3289.3	547.1008	0	0	3836.7	0	0	0	198.4	198.4	3638.3
264.	2358.9	264.5404	0	0	2623.8	0	0	0	792.9	792.9	1830
265.	1619.4	515.0552	0	0	2134.6	0	0	0	181.7	181.7	1952.8
266.	2721.4	148.7925	0	0	2870.3	0	160.3	0	486.1	646.5	2223.7
267.	2711.9	369.0352	0	189	3270.2	0	189	0	583.1	772.1	2498.1
268.	2118.4	549.0682	0	374.5	2667.8	0	0	0	193.7	193.7	2474
269.	2258.1	449.9201	0	315.1	2708.2	0	0	0	472.8	472.8	2235.4
270.	3420.7	950.0613	0	0	4371.1	0	0	0	393.3	393.3	3977.7
271.	2034.1	484.6909	0	0	2518.9	0	0	0	497.9	497.9	2021
272.	5535	653.3718	0	672.9	6861.7	0	336.4	0	1033.9	1370.4	5491.3
273.	2447.6	689.7024	0	0	3137.5	0	177	0	694.7	871.7	2265.8
274.	1753.3	452.3274	0	0	2205.8	0	0	0	467.5	467.5	1738.2
275.	4986.6	0	0	0	4986.9	0	0	0	251.4	251.4	4735.4
276.	2647	328.6373	0	0	2975.8	0	178.6	0	524	702.6	2273.1
277.	2151.6	186.0272	0	0	2337.8	0	0	0	367.8	367.8	1969.9
278.	3735.3	0	0	183.8	3919.4	0	0	0	183.8	183.8	3735.6
279.	2311.2	0	0	189	2500.4	0	0	0	770.2	770.2	1730.1
280.	2121.6	0	0	189	2310.7	0	0	0	387.4	387.4	1923.3
281.	2615	0	0	0	2615.1	0	205.3	0	205.3	410.7	2204.3
282.	5620.5	0	0	0	5621	0	0	0	320.5	320.5	5300.4
283.	2967.4	0	0	183.8	3151.4	0	174.9	0	741.8	916.8	2234.6
284.	6160.1	940.1358	0	0	7100.9	0	593	0	611.2	1204.3	5896.6
285.	1692.4	0	0	166.8	1859.3	0	172.5	0	339.4	512	1347.3

286.	3619.4	0	0	401	4020.6	0	190.8	0	401.3	592.2	3428.4
287.	2310.5	392.4253	0	0	2703	0	0	0	394	394	2309
288.	1773.2	124.3816	0	125.6	2023.3	0	119.5	0	245.2	364.8	1658.5
289.	1871.9	172.6238	0	168.2	2212.9	0	0	0	518.8	518.8	1694
290.	2272.3	0	0	279.6	2551.9	0	0	0	428.5	428.5	2123.3
291.	2319.4	510.4492	0	257.8	3088	0	245.4	0	758.4	1003.8	2084.1
292.	3782.5	0	0	185.5	3968.3	0	0	0	572.2	572.2	3396.1
293.	2829.2	0	0	0	2829.3	0	0	0	617.4	617.4	2211.9
294.	3565.8	727.3672	0	0	4335.6	0	0	0	502.9	502.9	3832.7
295.	2585.9	136.8925	0	0	2750.1	0	160	0	484.2	644.3	2105.8
296.	2434.6	228.9565	0	0	2664	0	218.1	0	447.1	665.2	1998.7
297.	4193.1	254.0859	0	0	4447.6	0	0	0	254	254	4193.5
298.	2708.1	0	0	190.8	2899.1	0	0	0	954.9	954.9	1944.2
299.	4369.6	0	0	0	4370	0	0	0	214.7	214.7	4155.2
300.	4099.7	0	0	0	4100	0	0	0	435.3	435.3	3664.7
301.	2839.5	0	0	200.5	3040.3	0	0	0	804.6	804.6	2235.7
302.	3748.5	0	0	0	3748.8	0	0	0	260.4	260.4	3488.4
303.	2381.3	0	0	233.5	2615	0	0	0	720.3	720.3	1894.7
304.	2588.5	0	0	0	2588.7	0	0	0	638.5	638.5	1950.2
305.	2946	0	0	182.1	3128.3	0	180.2	0	550.8	731.1	2397.1
306.	3059.1	479.2849	0	0	3538.7	0	233.5	0	942.6	1176.1	2362.6
307.	2952.5	0	0	0	2952.7	0	0	0	342.5	342.5	2610.2
308.	2580.3	343.7749	0	0	2924.3	0	167.9	0	518.8	686.8	2237.5
309.	3132.1	0	0	0	3132.5	0	161	0	659.14	820.2	2312.2
310.	4310.9	263.7347	0	0	4575	0	0	0	1011.3	1011.3	3563.6
311.	3746.4	223.8419	0	0	3970.6	0	0	0	657.3	657.3	3313.3
312.	3727.4	0	0	0	3727.4	0	0	0	598.9	598.9	3128.5
313.	2189.3	152.0806	0	144.9	2486.5	0	292.1	0	589.1	881.2	1605.2
314.	5951.7	293.4513	0	0	6245.8	0	0	0	559.6	559.6	5686.2
315.	2676.6	0	0	204.6	2881.4	0	0	0	813.8	813.8	2067.6
316.	3794.1	0	0	169.6	3964	0	0	0	347.7	347.7	3616.2
317.	1961.7	0	0	385.4	2347.2	0	0	0	599.4	599.4	1747.7
318.	3240.4	160.0972	0	0	3400.7	0	0	0	312.4	312.4	3088.2
319.	2937.1	0	0	484.1	2937.5	0	239.6	0	992.6	1232.3	1705.2
320.	3062	0	0	502.5	3062.4	0	251.2	0	775	1026.3	2036.1
321.	2620.9	0	0	345.2	2621.1	0	170.8	0	699.2	870.1	1751
322.	3659.4	0	0	345.2	3659.7	0	0	0	345.4	345.4	3314.2
323.	3440.4	170.2401	0	178.8	3789.7	0	722.1	0	1081.8	1804	1985.7
324.	1976.8	153.6313	0	0	2130.7	0	165.6	0	334.9	500.6	1630.1
325.	4015	423.6147	0	0	4439	0	223.2	0	441.3	664.6	3774.4

Appendix 9: Research questionnaires

Addis Ababa University

College of Development Studies

Postgraduate program in Regional and Local Development Studies

Household Survey Questioner

Research Topic: Determinants of Seasonal Migration and its implication for food security: the case of Tsagbiji district, in Wag Himra Zone, Amhara Region

Questionnaires

Dear respondent, I am seeking information to get information on the determinants of seasonal migration and its implication for food security in Tsagibji District, in Wag Himra Zone, as part of the requirements for the award of Master in Regional and Local Development Studies at Addis Ababa University. Therefore, the questioner will have four parts and I kindly request you to provide information about the issue at least for maximum of thirty minutes. There may be no immediate direct benefit, however, the study can contribute to enhancing knowledge on migration and development and suggest improved policies directions. I wish to assure you that all data/information given by you will be treated confidentially and secretly. Therefore, I shall be grateful if you can provide information as much as possible.

I genuinely appreciate the information and time you have given us!

Kebele _____	Village _____
Code of Household Head (HH) _____	
Gender Household head	M= <input type="text"/> F= <input type="text"/>
Migration status	Migrant = <input type="text"/> Non- Migrant <input type="text"/>

Part 1: Demographic Characteristics of Household		Write the appropriate code or answer here	Remark
1.	Age (in years)		
2.	Marital Status (1=single 2=married 3= divorced 4=widowed)		
3.	Educational Status (can't read and write =0, Can read and write = 1, primary schooling =2, secondary schooling=3, college or university diploma =4)		
4.	Religion(1=orthodox 2= Muslim		

5. Could you list out the age category of your household members?

Age category (years)	Sex		Full time labor participant	Part time labor participant	Attending school	Total
	Male	Female				
Individuals who are less than and equals to 10						
Individuals who are 11-14						
Individuals who are 15-64						
Elders who are over 64						
Total family size						
Household size						

	Part 2: Socio-Economic Characteristic of households	Write the appropriate code or answer here	Remark
6.	Do have your own land for cropping? 1=yes 2=no		
7.	If yes for the above question, how much is your total farmland size (using local measurement or hectare)? _____		
8.	Types of cultivated land. 1. Own land, 2. shared land, 3. Rent 4. Other		
9.	How do you perceive the quality or fertility of your land? 1=fertile 2=medium fertile 3=less fertile 4=poor		
10.	have you get access to credit services last production year?(Yes=1, No=0)		
11.	Have you use fertilizer in last production year?(Yes=1, No=0)		
12.	Have you get extensions services in the last production year? Yes=1, no=0)		
13.	The roof house for the household 1. grasses/straw 2. Iron, 3. other		
14.	Have you use improved seed in last production year? (yes =1, No=0)		
15.	How far is your home from the nearest market center? Per hours		
16.	Have your participate in PSNP or emergency program (yes=1, no =0),		
17.	If yes, Which type of relief assistance (direct PSP support =1, Public work PSP = 2, Emergency=3)		

18. Could you rank your occupation based main source of income?

Occupation based on income sources	Rank	Remark
(crop and livestock)		
Farming only		
Petty trade		
Laborer		
Others		

19. How much is annual expenditure of the household in birr/ per year? _____

20. Household annual income statistics from February 2018/19 in birr/ per year

Income sources	Income in birr/per year	Remark
Crop sale		

Livestock sale and livestock product sale		
Off farm		
Income from migration		
Remittance		
PSNP		
Other		
Total		

21.	Do you have livestock? write the Code 1) Yes 0) No								
	If yes, indicate the number of livestock you have last year:-								
Livestock number	Type of livestock								
	Oxen	Local cows	Bull	Heifers	Calves	Goats	Sheep	Donkey	Hens

Part 3: Migration-Related data records (only for households with migrant)

Part 3: Migration-Related data records		Write the appropriate code or answer here	Remark
22.	Is there any household member have migration experience?(Yes=1 No=0)		
23.	If yes, indicate the year of recent migration experience? _____		
24.	How did you get information sources/migration network from Previous Experienced Family members =1, Relatives=2, friends =3, Other=4)		
25.	Who decide the migration of HH members in your household? (HH head=1, other Household numbers=2, Other=3)		
26.	What is the main reason of migration? 1. poverty/food insecurity, 2. Unemployment, 3. Drought/natural disaster. 3. To earn additional income 4. influence of the villager/HH member		
27.	How many peoples migrated from your household? In number		
28.	A number of child migrants? in number		
29.	For how many months' migrants can stay in the destination. _____		
30.	Where is the exact destination of migrant household members?		
31.	What is the amount of income from migration income in cash and in kind in last year? In birr		
32.	How does migration change the food security of your household? (Increase=1, Decrease=2, Unchanged=3		
33.	Types of job in the destination		

34. Could you rank the push and pull factor (causes) of migration in your households?

	Push factors of migration	Rank	Pull factor in the destination	Rank
a.	Poverty/food insecurity		Better job opportunities	
b.	drought/Natural disaster /		Better services	

c.	To earn additional income		Relatives/friends already there	
d.	Unemployment (search of job)		Wage differentia	
e.	Influence of the villager/HH member		Other	
f.	Others			

35. For what purpose do you use the major amount of migration?

	Purpose	Frequency				
		Always	Very Often	Sometimes	Rarely	Never
1	We have use the migration income to purchase food grains					
2	We have use the migration income to repay debt					
3	We have use the migration income to buy cattle					
4	We have use the migration income to construct/improve house					
5	We have use the migration income to purchase agricultural inputs					
6	We have use the migration income for other activities					

	Effect of Migration on Different Household Indicators (Perception-based)	Strongly Agree	Agree	Undecided	Strongly disagree	disagree
I.	Migration can increase frequency of meal in my household					
II.	Migration can improve food security condition my households.					
III.	Migration can change my occupation.					
IV.	Migration helps us to construct tin roof house.					
V.	Migration can increase number of livestock size					
VI.	After migration I have increase numbers of rooms					

Part 4: Food Security Status Measurements

1. How many of food grain was **AVAILABLE** for your family consumption purpose during the past one-year production time (in Quintal)?

	Quantity in Quintals
--	----------------------

Types	Prodn	Obtained through Purchase	Obtained by remittance	Obtained through Aid	Total Gain (A)	Gift to others	Sal e	Post-harvest loss	Seed reserve	Total Loss (B)	Balance (A –B)
Teff											
Barley											
Maize											
Sorghum											
Wheat											
Bean											
Chickpea											
Total											

2. The Months of Adequate Household Food Provisioning (MAHFP) Adopted from FANTA project, 2010 by USAID

1	Did you face food shortage during last year? 1) yes 2) No											
2	During which months you had a food shortage for the past 12 months. please fill 1 if respondent identifies that month as one in which the household did not have enough food to meet their needs, 0 for response No											
(MAHFP)	Months											
	Septembe	October	Novembe	Decembe	January	February	March	April	May	June	July	August
Months of food shortage												

3. Household Food Insecurity Access Scale (HFIAS) Measurement Tool

No	Questions: For the last four weeks(one month),	Response 1. Yes 2. No	If yes, how often did this happen?
		Code	Code 1
1	Did you worry that your household would not have enough food?		
2	Were you or any household member not able to eat the kind of foods you preferred because of lack of resources?		
3	Did you or any household members have to eat a limited variety of foods due to lack of resources?		
4	Did you or any household members have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?		
5	Did you or any household members have to eat a smaller meal than you felt you needed because there was not enough food?		
6	Did you or any household members have to eat fewer meals in a day		

	because there was not enough food?		
7	Was there ever no food to eat of any kind in your household because of lack of resources to get food?		
8	Did you or any household members go to sleep at night hungry because there was not enough food?		
9	Did you or any household members go a whole day and night without eating anything because there was not enough food?		

Code 1: How often did this happen

1= rarely (once or twice)

2= sometimes (three to ten times)

3= often (more than ten times)

Appendix 10: Interview Schedule for FGD and Key Informants

Interview Schedule for FGD and key informant interview (KII)

Kebele _____

Type of the Household (Migrant=1, Non-migrant=2) _____

Date of Interview _____

Types of Respondent (HH Member=1, gov't official, =2 Kebele experts=3 _____

Interview checklist for Selected Key Migrants households

1. Objective: Determinants of seasonal migration

❖ General characteristics of livelihood

- ✓ What is main Livelihood activities and socio- economic statues of your households in your locality?
- ✓ Is your locality being more vulnerability to drought, food insecurity, environmental limits? How do you cope from this vulnerability?
- ✓ How do you describe the agricultural productivity performance of your localities? Have you ever faced constraints on agricultural production?
- ✓ How do you describe the availability of development services (extension and irrigation services, health, school, credit, water supply, market regulation, and other facilities)? Please discuss deeply

❖ Determinants of seasonal migration

- ✓ What are major push and pull factor of seasonal migration in your locality? (economic, cultural and social factors)
- ✓ Are local peoples adopting migration as an alternative livelihood strategy (optional) or as mandatory to coping strategy droughts, food insecurity and other environmental stress in your locality?
- ✓ When and how often does seasonal migration take place?
- ✓ Duration peoples migrated from Seasonal out-migration.
- ✓ How do you perceive the stream, trend and diversity of seasonal migration (in terms of age, sex, seasonality, economic statues, destinations and educational statues)?
- ✓ What are the main destination areas(place) of the migrants (exact place of destination)?

2. Objective: Food security statues

- ✚ How do you perceive the food insecurity situation of your localities?

- # How do you perceive food security statuses of migrant household in your locality? by production, access and diet quality of food.
- # Which groups of people do you think are more vulnerable to food insecurity and why?
- # How long people are food insecurity in your locality.
- # What are the survival strategies used by people in the area to cope with food stress? (coping strategies for food insecurity)
- # Are there any measures taken by the government to improve household food security)?
- # Is there Linkage of seasonal migration with poverty/ food security and other infrastructural development?

3. Objective: Effect of (impacts) of seasonal migration

- ☞ What are main impact of seasonal migration on livelihoods of households, in terms of improvement of social status, economic status and standard of living,
- ☞ What is your opinion regarding the impact of seasonal migration on household's food security? What is the impact of seasonal migration on food security of households in your locality? (in terms of access to food, food production?)
- ☞ Do you think that seasonal migration and food insecurity interrelated in your locality? How?
- ☞ Impacts on the household due to redistribution labor through migration
- ☞ What is the negative impacts on the households at places of origin?

